FICHTNER

Consulting Engineers Limited

Chirk Particleboard Factory

Kronospan

Schedule 5 Response No 3

ENGINEERING CONSULTING

Document approval

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Contents

1 Air Quality Modelling

1.1 Dispersion of releases from the original Particleboard WESP.

Following commissioning of the new Particleboard (PB) WESP and Chip Dryer 4, we understand that Kronospan intend to re-direct releases to air from PB manufacturing to the new PB WESP. When this happens, the only remaining release to air through the old Particleboard WESP will be press abatement gases from MDF1 & 2 and the particleboard press. Emissions from Chip Dryer 4 will be released through the new PB WESP.

This emission scenario has not been considered in the air quality assessment, forming Appendix C of variation application EPR/BW9999IG/V008. Therefore, please update the existing air quality model and accompanying report to include this scenario. The scenario must be considered for both Likely and Worst Cases, both in terms of potential impact on human health using the relevant long and short-term air quality standards and potential impact on Critical Levels and Loads at all ecological sites identified within the existing air quality assessment.

This emission scenario must be assessed to ensure that dispersion conditions for the press abatement gases are sufficient to prevent harm to human health and the environment.

The WESPs have been numbered:

- The Old WESP for Driers 2 & 3 (OSB) is: WESP 32
- The new WESP for Drier 4 is: WESP 21

The Particle Board Drier 4 emissions will be directed to the new PB WESP 21 (i.e. the new WESP). The OSB would use the reconditioned Driers 2 and 3 and would emit to atmosphere via WESP 32 (the existing WESP). Emissions from the Particle Board, OSB and MDF press abatement system emissions will be discharged through the old WESP 32 (i.e. the existing WESP).

The impact was considered in the Proposed Operations scenario. Although not specifically noted in Tables 3.1 or Table 3.2 of the Dispersion Modelling Assessment the preceding text explains that the new chip plant and OSB does not change any of the described operating scenarios. The impacts set out in the Dispersion Modelling Assessment include the contribution from the PB WESP. This is explained throughout Section 10 the impacts of the proposed operations include the PB WESP (which has now been renamed WESP 21).

1.2 Bag filter abatement plant

The Chirk Particleboard Factory installation is equipped with various items of bag filter plant, for abatement of particulate matter (PM) arising inside the process buildings. These plants are subject to Emission Limit Values (ELVs) currently set in Table 6.10.1 of Wrexham County Borough Council Permit WCBC/IPPC/03/KR(V3). However, releases from the bag filter plant are not included as dispersion model inputs in the air quality assessment (Appendix C of variation application EPR/BW9999IG/V008).

As such, please confirm the number and location of the bag filter units on site, together with the process areas they serve. Please also update the air quality modelling files and associated assessment report to include releases from these items of plant. More specifically, the modelling for both the Likely and Worst Cases shall be updated to include the predicted impact of long and short-term releases from the bag filter plants. This shall be combined with the process contribution (PC) for other on-site sources of PM to give the overall PC associated with the entire site. This shall *then be compared against the relevant air quality standards set for the protection of human health.*

A figure showing the location of each bag filter unit and the process area they serve is provided in Appendix E.

The dispersion plot files are presented in Appendix A, with the model input table for the additional sources provided in Appendix B. As shown at areas of relevant exposure the predicted impact does not exceed any AQAL. The predicted impacts are based on the following highly conservative assumptions:

- Flow rates are based on the maximum for the extraction equipment;
- The release rates of pollutants have been calculated assuming the release concentration is 5 mg/Am^3;
- Each extraction unit continually operates at maximum capacity; and
- The entire PM release rate consists of only PM_{10} or $PM_{2.5}$ for comparison with the AQALs.

The release concentration has been assumed to be 5 mg/m^3 from each of the identified bag filters. The BAT document for the production of wood based panels regarding bag filters explains that the emission level achieved by bag filters or cyclofilters is generally below 5 mg/m^3.

1.3 Ammonia Modelling: K8 Biomass Boiler and other sources

Table 6.5.1 of the WCBC permit, requires Kronospan to monitor releases to air of ammonia (NH_3) from K8 Biomass Boiler. This is because emissions of NH_3 to air can be associated with the injection of ammonia/urea into the combustion chamber as part of the Selective Non-Catalytic Reduction (SNCR) for nitrogen oxides (NO_x) abatement.

Please confirm if there are any other point source releases of NH_3 to air on site besides K8. If there are, releases from these emission points shall also be included in the updated modelling requested below.

Releases of ammonia from K8 have not been included in the air quality assessment, forming Appendix C of variation application EPR/BW9999IG/V008. Therefore, please update the modelling files and assessment report to include this pollutant. The updated modelling shall consider both the Likely and Worst Cases and assess the predicted impact on human health using the short and long term Environmental Assessment Levels shown on the gov.uk webpage "Air Emissions Risk Assessment for Your Environmental Permit"

In addition, predicted NH_3 releases shall be assessed against the appropriate Critical Level set for the protection of vegetation and ecosystems, which can be found on the same web page. This shall be done for all ecological sites identified within the existing air quality assessment.

For nutrient nitrogen and acid deposition, the predicted PC for NH_3 must be added to the NO_x PC as per the methodology described in AQTAG 06 "Technical Guidance on detailed modelling approach for an appropriate assessment for emissions to air" (attached to covering email as a PDF). This overall figure for the site shall then be used to assess deposition against all the relevant Critical Loads for each interest feature at the ecological sites identified in the air quality assessment.

The current WCBC permit does not include an emission limit for ammonia. However, it is acknowledged that ammonia will be released from the Selective Non-Catalytic Reduction (SNCR) system installed on the K8 biomass plant. In line with similar processes it has been assumed that emissions of ammonia from the K8 biomass plant would be no greater than 15 mg/Nm^3 (expressed at 6% reference oxygen content). It can be confirmed that there are no other point source emissions to air of ammonia from the Facility.

The K8 biomass plant is also the only source of hydrogen fluoride from the Facility whether this emits via its own dedicated stack or via the MDF drier cyclones. Therefore, it has not been necessary to re-model to determine the impact of ammonia emissions as these have been scaled from the predicted hydrogen fluoride impacts.

The ELV for hydrogen fluoride is 3 mg/Nm^3 and therefore the impacts of hydrogen fluoride have been scaled by the ratio between the ELV for hydrogen fluoride and ammonia to determine the impact of ammonia emissions (i.e. hydrogen fluoride impact x (15/3)).

The tables in Appendix B set out the impacts in the same format as the detailed results tables presented in Appendix C and Appendix D to the air quality assessment.

As shown in Table 2 in Appendix B, the impact of ammonia emissions is well below 1% of the long term and 10% of the short term AQAL for the protection of human health. Therefore, the impact can be screened out as 'insignificant'.

As shown in Table 3 in Appendix B, the impact of ammonia emissions at ecological sites can be screened out as 'insignificant' at all sites with the exception of Chirk Castle SSSI. At Chirk Castle SSSI the predicted impact is 2.1% of the Critical Level. This assumes that the Critical Level for lichen sensitive communities applies. When considering the impact of nitrogen deposition the impact of process emissions is less than 1% of the Critical Load at all statutory designated site with the exception of Chirk Castle SSSI. At the local ancient woodlands the impact is less than the Critical Load.

When considering the impact of acid deposition the impact of process emissions is less than 1% of the upper Critical Load for each habitat type (including those additional habitats considered in in the response set out in Section 2.2). However, the impact is predicted to be greater than 1% of the lower Critical Load for most habitats. The effect of the additional contribution from ammonia slightly increases the overall impact but does not change the conclusions set out the air quality assessment.

2 Habitats assessment

2.1 Justification for emissions scenario used in modelling.

The Air Quality assessment forming Appendix C of variation application EPR/BW9999IG/V008 considers two different emissions scenarios:

***Likely Case**: driers emitting NO_x calculated from typical emissions, all other sources emitting at the relevant ELVs.*

***Worst Case:** driers emitting NO_x calculated from BAT-AEL, all other sources emitting at the relevant ELVs.*

Within the modelling and associated report, the human health assessment considers the impact of emissions to air in both the Likely and Worst Case scenarios. However, the ecological assessment is based solely on the Likely Case.

Please update the modelling files and assessment report, to include a consideration of the Worst Case for the ecological assessment. This is required because in theory the installation can operate at the ELVs in the permit, so releases to air must be assessed at that level.

The models provided included the likely-case and worst-case modelling but results were only presented in the air quality assessment for the likely case for ecological impacts. This approach was considered appropriate as the Facility operates well below the ELV for oxides of nitrogen. The only difference between the likely and worst case scenario is the assumption over the emissions of oxides of nitrogen. Therefore, only updated results relating to the change in oxides of nitrogen have been provided. This includes the following impacts:

- Annual mean oxides of nitrogen;
- Daily mean oxides of nitrogen;
- Nitrogen deposition; and
- Acid deposition.

The nitrogen and acid deposition impacts include the contribution from ammonia, sulphur dioxide and hydrogen chloride in line with AQTAG. These tables include the assessment against the Critical Loads for additional habitats considered in the response set out in Section 2.2.

The modelling has shown that in the worst-case emissions scenario the daily mean PEC is predicted to exceed the Critical Level. The history of the Chirk Castle SSSI is that it was designated as a SSSI in 2011 some-time after the Kronospan Facility had been operating. Albeit at a slightly lower loading than currently and proposed. A report was produced by NRW (Evidence Report No. 317) on the assessment of the current condition of the qualifying features at the Chirk Castle SSSI in 2018. This showed that site condition is increasing and is in a favourable position.

2.2 Critical Loads Assessment for Key Ecological Interest Features

Please provide an assessment of nutrient nitrogen and acid deposition against the relevant Critical Loads for the following Interest Features of the Berwyn and South Clwyd Mountains Special Area of Conservation (SAC):

- *Dry Grassland (Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia);*

- *Dry Heathland habitats (European Dry Heaths); and*
- *Upland (Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii), Calcareous rocky slopes with chasmophytic vegetation)*

Whilst we acknowledge that such an assessment has been conducted for the Blanket Bog interest feature, the other interest features must also be assessed, as they may be associated with different critical loads and can be located in different geographical units of the SAC, so the distance to site and background deposition in these areas may differ.

The detailed results tables presented in Appendix B include consideration of the impact against the habitat specific Critical Loads for the habitats requested.

The relevant Critical Load Class for nitrogen deposition for the identified habitats is blanket bogs which was previously assessed. However, the results tables in Appendix A include consideration of the additional contribution from ammonia. Including ammonia, the process contribution is less than 1% of the minimum Critical Load for both the likely case and 1.2% of the minimum Critical Load for the worst-case emissions scenario.

The relevant Critical Load Class for acid deposition for the identified habitats include blanket bogs, dry grassland, European dry heaths and upland calcareous rocky slopes. The acidity Critical Load for blanket bogs is the most sensitive and as such this is why the assessment only considered this Critical Load. However, the results tables in Appendix A have been updated to include consideration of the additional contribution from ammonia and the Critical Loads for other habitats. As shown the impact is greatest for bog habitats being 1.6% of the lower Critical Load but only 0.6% of the upper Critical Load for the likely case emissions scenario. This impact is increased to 2.0% of the lower Critical Load but only 0.8% of the upper Critical Load for the worst case emissions scenario.

3 Noise modelling

3.1 Fichtner Schedule 5 response (28 May 2019)

i) *Table 5 showed modelled peak vehicle movements for daytime (19:00 – 20:00) and night-time (00:00 – 01:00). However, Table 3 showed higher numbers of vehicle movements in daytime (14:00 – 15:00) and at night-time (05:00 – 06:00). As such, we consider that Table 5 may not represent a worst-case impact. On this basis, please revise the noise modelling files and assessment report to ensure that the assumptions for peak vehicle movements used in the noise modelling are based on observed peak vehicle movements as shown in Table 3 of the Fichtner response.*

Please refer to Table 5.11 of the NVC Noise Impact Assessment (24 May 2019) for analysis of the peak hour periods which provides the information on the hours referenced. Table 5 of the Fichtner Schedule Response, dated 28 May 2019, should therefore have included those periods between 1400-1500 hours and 0500-0600 hours as detailed in Table 3. On this basis, the noise assessment submitted with the Schedule 5 Response represents a worst-case impact.

ii) *Section 3.4 of the Fichtner response states that:*

"The noise model relating to HGV movements allows for mobile plant operating to offload the vehicles, idling engines and reversing alarms".

Table 6 lists the source levels for mobile plant and HGVs, however there is no source level for reverse alarm noise in this table. Please confirm whether there are any reverse alarms for HGVs and Front Loaders and if so, please demonstrate how the sound power level for the reverse alarms has been included in the noise model and assessment. (See also item (v) below).

HGVs entering or leaving the Site will for the majority of the time enter via the one-way system. Therefore, there is no need for vehicles to reverse.

The lorry park is designed to provide a holding area to avoid queueing on the B5070. This allows HGV's to travel down the park, turn and then enter the site without having to reverse.

HGVs may need to park and manoeuvre into loading bays during day-time and night-time periods; however, at night-time this is very limited.

The sound power level used in the noise assessment of 103dB(A) sound power is based on library data of HGV movements including the use of reversing alarms to offload, engine idling and then moving off at a distance of 10m which is then converted to a sound power level (i.e. 75dB(A) @ 10m). This is considered to be a conservative assessment of noise generation by HGVs as can be seen by the various noise models the assumption is that the HGVs generate 103dB(A) regardless of the travel path at the rear of the Site. Measurements of HGVs at lower speeds around the Site (i.e. front entrance of the Site) would be nearer to 98dB(A) as they are not placing engines under any significant load. The front loader mobile plant vehicles also include an allowance for reversing as stated in Table 6 (i.e. within the Schedule 5 Rev 1 response) under the same methodology, as described.

3.2 Noise and Vibration Consultants (NVC) Ltd. - Noise Impact Assessment (24 May 2019)

iii) Figure 2 of the NVC Ltd report shows the approximate Kronospan site boundary in blue and Figure 4 shows the on-site vehicle routes. Receptor 4 (Maes-y-Waun) is located close to the southern end of the lorry park. Modelled on-site vehicle movement routes close to the entrance (pointed by the red arrow) are extracted from the submitted modelling files and attached in the image below. This shows that no HGV movements in the lorry park were included in the noise impact modelling, as the lorry park is located to the south of the red arrow.

Therefore, please confirm whether there are any lorry movements in the lorry park. If the answer is yes, then the lorry movement (including reverse, reverse alarm noise) within the lorry park shall be included in the noise impact assessment.

As previously explained the lorry park is designed to allow the HGVs to travel down, circle and return without the need for reversing alarms. The noise model has been updated to reflect the use of the lorry park for general holding of vehicles during peak traffic movements. In addition, the model has been updated to include for the offloading of logs from train deliveries using the log grab.

HGV movements around the front of the Site is based on a sound power level of 98dB(A) as there would not be any reversing and vehicles would be under very low speed with low engine load due to limit on speeds.

Taking this into consideration, Tables 5.11 to 5.13 (of the `Updated Noise Assessment' submitted in Appendix A of the Schedule 5 Response dated 28 May 2019) have been updated and provided below.

Table 5.11: Noise Contribution from HGV, Mobile Plant & Train Movement & Offload

Receptor Position	Predicted Noise Level Contribution from HGV, Mobile Plant & Train Movement/Offload $LAeq_{1hour}$ dB [with OSB Manufacturing movements]			
	1400-1500 hours	1900-2000 hours	0000-0100 Hours	0500-0600 Hours
1. Linden Avenue	38.0 [39.2]	36.0 [36.6]	33.9 [33.9]	37.6 [38.6]
2. Wern	43.7 [45.0]	40.6 [41.5]	37.4 [37.4]	42.8 [43.9]
3. Holyhead Rd/ West View	42.2 [43.4]	38.0 [39.1]	33.2 [33.3]	40.6 [41.9]
4. Maes-y-Waun	43.9 [45.0]	39.3 [40.1]	33.6 [34.4]	42.3 [43.1]
5. Shepherds Lane	34.7 [35.8]	30.3 [31.2]	25.4 [25.9]	33.2 [34.1]
6. Mondelez Entrance (Formerly Cadbury's)	35.8 [36.9]	31.4 [32.2]	26.3 [27.0]	34.4 [35.2]
7. Canalwood Industrial Estate	38.4 [38.9]	35.5 [35.7]	33.6 [34.0]	37.3 [37.6]
8. Llwyn-y-cil Road	32.9 [33.7]	37.3 [37.4]	36.9 [37.0]	37.8 [38.0]
9. Opposite Chirk Castle back gates	35.2 [36.3]	37.6 [37.9]	37.1 [37.1]	38.5 [38.7]

In addition, Table 5.12 has been updated to include the Wood Chip Prep and Dryer plant, Chipper refurbishment and the offloading of the train which was included but not listed in the title. The subsequent paragraphs have also been updated in line with the results in the table.

Table 5.12: Predicted Cumulative Noise Contribution from the OSB Manufacturing Facility & Gas Engines 4 & 5 and consented/appealed development (i.e. CHP Gas Engine facility, Biomass, RCF Facility, Chip Wash Pre-heating & MF Press & Ventilation system including noise control measures) Flaker Facility, Chipper, Wood Chip Prep/Dryer & HGV, Mobile Plant & Train movement & offloading during peak hours

Receptor Position	Time Period	Predicted Cumulative Noise Contribution from consented Development & Proposed OSB & Gas Engines $LAeq_{1hr}$ dB	Predicted Cumulative Noise Contribution from consented Development & Proposed OSB & Gas Engines with Vehicles, Trains & mobile plant $LAeq_{1hr}$ dB	Typical Residual & Background Noise level 2011 LAeq & [LA90] dB	Typical Residual & Background Noise level 2016 LAeq & [LA90] dB	Rating compared to background noise LA90 2011 [2016] dB(A)	Level difference between existing and development noise in terms of LAeq 2011 [2016] dB
1. Linden Avenue	Daytime Night-time	**38** **38**	**40-41** **39-41**	51 [47] 43 [40]	50 [45] 42 [40]	-6 [-4] +1 [+1]	-10 [-9] -2 [-1]
2. Wern	Daytime Night-time	**41** **41**	**44-46** **42-46**	58 [48] 53 [46]	60 [55] 47 [45]	-2 [-9] 0 [+1]	-12 [-14] -7 [-1]
3. Holyhead Rd/ West View	Daytime Night-time	**39** **39**	**42-45** **40-44**	60 [50] 48 [44]	61 [53] 46 [44]	-5 [-8] 0 [0]	-15 [-16] -4 [-2]
4. Maes-y-Waun	Daytime Night-time	**39** **39**	**43-46** **40-45**	56 [52] 52 [51]	59 [51] 45 [41]	-6 [-5] -6 [+4]	-10 [-13] -7 [0]
5. Shepherds Lane	Daytime Night-time	**36** **36**	**38-39** **37-39**	53 [48] 46 [45]	56 [46] 39 [35]	-9 [-7] -6 [+4]	-14 [-17] -9 [0]
6. Mondelez Entrance (Formerly Cadbury's)	Daytime Night-time	**38** **38**	**39-40** **38-40**	57 [52] 52 [50]	57 [46] 37 [35]	-12 [-6] -10 [+5]	-17 [-17] -12 [+3]
7. Canalwood Industrial	Daytime	**47**	**47**	62 [60]	60 [56]	-13 [-9]	-15 [-13]

Receptor Position	Time Period	Predicted Cumulative Noise Contribution from consented Development & Proposed OSB & Gas Engines $LAeq_{1hr}$ dB	Predicted Cumulative Noise Contribution from consented Development & Proposed OSB & Gas Engines with Vehicles, Trains & mobile plant $LAeq_{1hr}$ dB	Typical Residual & Background Noise level 2011 LAeq & [LA90] dB	Typical Residual & Background Noise level 2016 LAeq & [LA90] dB	Rating compared to background noise LA90 2011 [2016] dB(A)	Level difference between existing and development noise in terms of LAeq 2011 [2016] dB
Estate	Night-time	**47**	**47**	60 [60]	54 [53]	-13 [-6]	-13 [-7]
8. Llwyn-y-cil Road	Daytime Night-time	**42** **42**	**43** **43**	57 [49] 53 [49]	50 [43] 47 [46]	-6 [0] -6 [-3]	-14 [-7] -10 [-4]
9. Opposite Chirk Castle back gates	Daytime Night-time	**42** **42**	**43** **43**	54 [48] 49 [48]	55 [46] 45 [43]	-5 [-3] -5 [0]	-11 [-12] -6 [-2]

Note: The above results show the significance of the vehicle, train and mobile plant movement at site particularly at receptors 1,2,3,4 and 5, which would not have been applicable to a BS4142 assessment pre 2014 as the standard was only relevant to fixed plant operation.

The results of the `worst case' cumulative noise show that the cumulative effect of all plant consented since 2011 and peak vehicle, mobile plant and train movement compared with the baseline background and residual noise in 2011 and 2016.

The results show that when comparing the `worst case' cumulative site noise contribution and residual noise levels recorded at residential receptors in 2011, the site noise is shown to be between 2dB and 15dB lower. When comparing background sound levels from 2011, the results show site noise is 9dB below background and up to 1dB above background. This is not deemed to be a significant impact.

The results show that when comparing the `worst case' cumulative site noise contribution and residual noise levels recorded at residential receptors in 2016, the site noise is shown to be between 0dB and 17dB lower. When comparing background sound levels from 2016, the results show site noise is 8dB below background and up to 4dB above background. This is not deemed to be a significant impact.

It is important to note that predicted noise levels at Shepherds Lane does not include any screening effects from properties in intervening ground between the noise sensitive receptors and the Site, which is likely to be reduce site noise predictions significantly. The increase of +5dB at R6 (Mondelez Entrance) which is not at a residential property boundary.

Table 5.13 below has been updated to allow for the vehicle, mobile plant and train movement predictions.

Table 5.13: Cumulative Effect of Existing Warehouse, Storage Building & Sifters and existing Chipper/Flaker compared with Proposed OSB Manufacturing Facility, Gas Engines 4 & 5, Raw Board Store and Flaker Facility & HGV, Mobile Plant & Train movement during peak hours

Receptor Position	Time Period	Predicted Noise Contribution from Existing Facilities $LAeq_{1hr}$ dB	Typical Residual Noise level 2011 [2016] LAeq [LAeq] dB	Level difference between existing and development noise in terms of LAeq dB	Predicted Noise Contribution from New Facilities $LAeq_{1hr}$ dB	Level difference between existing and new facility development noise in terms of LAeq dB
1. Linden Avenue	Daytime Night-time	43-44 43-44	51 [50] 43 [42]	-7 [-6] 0 [+1]	40-41 39-41	-10 [-9] -2 [-1]
2. Wern	Daytime Night-time	48-49 48-49	58 [60] 53 [47]	-9 [-11] -4 [+2]	44-47 43-46	-11 [-13] -7 [-1]
3. Holyhead Rd/West View	Daytime Night-time	45-47 44-46	60 [61] 48 [46]	-13 [-14] -2 [0]	42-45 39-43	-15 [-16] -5 [-3]
4. Maes-y-Waun	Daytime Night-time	41-45 38-44	56 [59] 52 [45]	-11 [-14] -8 [-1]	41-45 37-44	-11 [-14] -8 [-1]
5. Shepherds Lane	Daytime Night-time	37-38 38-39	53 [56] 46 [39]	-15 [-18] -7 [0]	35-37 36-37	-16 [-19] -9 [-2]
6. Mondelez (Formerly Cadbury's)	Daytime Night-time	35-38 33-37	57 [57] 52 [37]	-19 [-19] -15 [0]	35-38 33-37	-19 [-19] -15 [0]
7. Canalwood Industrial Estate	Daytime Night-time	44 44	62 [60] 60 [54]	-18 [-16] -16 [-10]	44 44	-18 [-16] -16 [-10]
8. Llwyn-y-cil Road	Daytime Night-time	39-41 41	57 [50] 53 [47]	-16 [-9] -12 [-6]	39-41 41	-16 [-9] -12 [-6]
9. Opposite Chirk Castle back gates	Daytime Night-time	47-48 47-48	54 [55] 49 [45]	-6 [-7] -1 [+3]	42-43 43	-11 [-12] -6 [-2]

The results of the above cumulative analysis including peak vehicle, mobile plant and train movement/loading compared with the residual noise in 2011 and 2016.

The level difference compared with the 2011 results for the existing facilities shows the site noise level to be similar to or below the existing residual noise. The results of the analysis show no significant impact.

In relation to survey results in 2016, the level difference compared with the new facilities (under maximum noise conditions) are shown to be between 0dB and 19dB below residual noise at residential receptors. The level difference at residential receptor positions ranges between 1dB and 19dB below residual noise. The results of the analysis show no significant impact.

iv) *Paragraph 5.5.8 (iv) states that:*

"The unloading of trains commences when the train arrives, and this would normally take around 2½ hours to complete."

Please confirm the process involved in unloading Roundwood from a train and the items of mobile plant used for this activity. It is noted that the Cadna model shows that none of the front loaders operate for >1 hour continuously (steady state) at any point during the unloading of trains. Instead they are shown as being operational for 240 minutes in a 12-hour day, which equates to 20 minutes operating time per hour. Please clarify what this on-time correction is for.

When the train arrives the process of unloading a train involves firstly parking a front loader or log handler across the ramp and at the north road to prevent access to the railway line before the train reverses. The train then reverses and then the carriages are unstrapped. Each of the carriages are then unloaded using the mobile log grab and when empty the inside of the carriage is blown clear using leaf blowers and the carriage re-strapped before the next carriages are emptied. After the train has been emptied various checks are made before the train departs. The train unloading therefore does not require any significant use of mobile plant and front loaders are restricted to the western side of the site between 2130 and 0730 hours. Loading shovels are used intermittently to feed shaking floors and bunkers on the north west area of the site.

The noise model includes for the following movements, which is considered to a conservative representation of mobile plant operating on site:

Point sources (front loaders and HGVs operating in stationary position)

– 2 x HGV's [Sound Power Level 98dB(A)] at NW corner and adjacent to OSB area in a steady state operation (i.e. constant)
– 3 x Front Loaders [Sound Power Level 105dB(A)] at NW corner for 20 minutes each hour for each one
– 1 x Log grab [Sound Power Level 108dB(A)] at NW corner in steady state operation (i.e. constant)

Line Sources:

– Front loaders operating in area around offloading area, sifter and chipper
– 4 x Front Loader circuits based on 20 movements for each circuit per hour [Sound Power Level 108dB(A)] in steady state operation (i.e. constant)

Refer to each noise model noise source (i.e. point and line source) for further detail. The 20 -minute operation for front loaders only refers to static periods of the plant in operation and not as a line source (i.e. when vehicle is manoeuvring), which is pessimistic view of generated noise.

v) Section 5.5.9 states that:

> *"The noise model relating to HGV movements allows for mobile plant operating to offload the vehicles, idling engines and reversing alarms."*

However, no reverse alarm noise was mentioned in the submitted noise modelling files. Please confirm whether reverse alarm noises were included in the noise modelling and explain where they are. (See also item (ii) above).

Refer to the details provided in response to Q3 (ii) explaining how noise from reversing alarms is included in the assessment. It should be noted that the reversing alarms on mobile plant at the Site are the `smart' type that adjust the volume according to the ambient (i.e. self-adjusting from 82dB(A) to 102dB(A) sound power level).

vi) BS4142:2014 outlines the rating penalty to correct the specific sound level if a tone, impulse, intermittency or other characteristic occurs, or is expected to be present, for new or modified sound sources. No rating penalties were mentioned in the submitted report. Therefore, please confirm that the use of rating penalties has been considered in the noise impact assessment and provide relevant justification for the current position if none have been used.

The noise consultant which has supported Kronospan with the noise assessment work has advised that based on their subjective observations during noise survey work at the noise sensitive receptors there has not been any perceptible tonality or impulsive noise from the on-site operations.

The noise consultant has advised that during the daytime ambient noise is dominated by local road traffic and investigation into any significant noise along the western boundary of the Site was shown to be emanating from dust extraction fans located on an adjacent works to the Kronospan site (i.e. not associated with Kronospan) off the Canalwood Industrial Estate. Other noise sources in the area are associated with the operation of the Mondelez site (formerly Cadburys). Frequency spectra analysis based on one-third octave band centre frequencies during the 2016 noise survey showed no significant tonality within the spectral profile, which further supports this subjective evidence.

The site operates continuously, and no distinctive intermittent character is evident at receptor positions from site noise sources.

Taking the above into consideration, the predicted noise from the Site does not require any noise character penalties.

vii) Please provide an electronic copy of the noise modelling file which was used for the modelling predictions in Table 5.12 of the NVC Ltd report.

The noise model has been updated to reflect the addition of the Wood Chip Prep and Dryer plant, Chipper refurbishment and the offloading of the train as reflected in the response to Q3 (ii). The updated electronic CadnaA files are provided with this submission.

viii) The noise modelling prediction height was set at 1.5 m above the ground for all the receptors except receptor 9 (Castle Back Gates) where it was set at 15 m. Please provide an explanation for this difference and the impact that this has on the modelling predictions.

The receptor position at the Castle Back Gates is located on a hillside and as such this has been included within the noise model as a higher point to reflect the elevated location. The increase in elevation from 1.5m to 15m at this location increases the noise level by +1.1dB due to the increase in height.

4 Proposed Oriented Strand Board (OSB) production – Operating Techniques & BAT assessment

Paragraph 2.12.3 of the Fichtner Supporting Information document in the current variation application (EPR/BW9999IG/V008) states that:

> *"The OSB line is subject to detailed design. Therefore, it is proposed that the Operating Techniques associated with the OSB line are submitted to NRW for information prior to the commencement of operation".*

The proposed OSB line forms part of the current application for variation. As such, we cannot reach a decision on whether to permit the future operation of OSB, without reviewing the proposed operating techniques associated with all aspects of OSB production (e.g. including use of different resins).

Operating techniques are key appropriate measures that are employed to control emissions from the proposed process. Therefore, please submit the proposed written operating techniques for OSB. These must demonstrate if and how the proposed OSB process will comply with the industry Best Available Techniques (BAT) set out in EPR 1.00 "How to Comply with your Environmental Permit", the BAT Conclusions for the Production of Wood-based Panels, as well as any other applicable technical guidance or BREF. These can be submitted as an annex to the existing BAT Conclusions Review which forms Appendix D of the current variation application EPR/BW9999IG/V008.

Also, whilst we recognise that the proposed emissions to air from the OSB process have been modelled and assessed as part of the Air Quality Assessment in Appendix C of the variation application, these proposed emissions must also be included in Appendix D to show the expected compliance status of OSB against all the relevant OSB BAT-AELs (Emission Level associated with the Best Available Techniques).

This information will allow us to review your BAT assessment. If we decide that the proposed operating techniques represent Best Available Techniques (BAT), we will reference them in your Permit. We will therefore expect you to operate your site in line with these operating techniques.

The proposed design and operating techniques for OSB production have been reviewed against the requirements of the BAT Conclusions for the Production of Wood-based Panels. The review is presented in Appendix D.

5 K7 & K8 boiler Segregation procedure.

The third bullet point of Kronospan's response to Q13 of the Second Schedule 5 notice received on 28 May 2019 states that:

> *"K7 will not process non-exempt biomass fuels. Kronospan have controls in place to manage the movement of biomass and biomass fuels within the Facility. These procedures will ensure that only the fuels set out in Table 2 are processed at either K7 or K8 boiler or used in board manufacture. The procedures will prevent non-exempt biomass fuels from being combusted in the K7 boiler".*

Procedure KC/LOGY/PRO/0008 (revision. 3) "Boiler Fuel Creation Procedure" was supplied on 3 July 2019, in support of this statement. It is noted that Table 1 of the procedure allows for reject material from manufacturing (non-particleboard only) to be fired in K7, implying that reject material from Medium Density Fibre board (MDF) production can be fired in K7 boiler.

The Industrial Emissions Directive (IED) Article 3, (31)(v) states that in relation to wood waste, biomass means:

> *"wood waste with the exception of wood waste which may contain halogenated organic compounds or heavy metals as a result of treatment with wood preservatives or coating and which includes, in particular, such wood waste originating from construction and demolition waste"*

We consider that reject material from Particleboard and MDF manufacturing which has been exposed to formaldehyde cannot be considered to be biomass in this context because it has been treated and coated by the manufacturing process. The firing of this waste would therefore need to be undertaken in a plant subject to Chapter IV of IED.

In view of this, please explain why the Boiler Fuel Creation Procedure states that for K7 "Reject material from manufacturing" extends to "non-particleboard only". Please confirm if reject material from MDF manufacturing is fired in K7 and if so, please demonstrate why this material is considered by Kronospan to be suitable for firing in K7 which is not currently subject to Chapter IV of IED.

Item 3 of the Boiler Fuel Creation Procedure explains that all source materials listed in item 1, (except for recycled fibre fines, chipped up MDF board and chip board from the zeno) are mixed by a bucket loader in the boiler fuel compound. If the boiler fuel source material listed in item 1 is mixed prior to feeding into the K7 biomass boiler, please provide written evidence to show how Kronospan ensures that waste codes such as "roadway sweepings" are not fed into K7 as part of the pre-mixed boiler fuel.

Finally, please confirm that all sources of boiler fuel listed in item 1, are accounted for by the biomass descriptions in Table 1 of the procedure.

Kronospan acknowledge that Particleboard is manufactured from recycled fibre, and will be subject to the requirements of Chapter IV of IED will apply to the combustion of the reject material from Particleboard manufacture. Therefore, it is not proposed to combust reject material from Particleboard manufacture in K7 boiler.

MDF is manufactured from virgin biomass which has been treated in the MDF refiner to separate out the fibres within the wood. Therefore, MDF is manufactured from exempt biomass in accordance with the definitions stated in IED) Article 3, (31)(v). Therefore, it will not contain halogenated compounds or heavy metals.

As explained in section 1.4.3 of the Supporting Information '*the fine wood fibre is immediately treated with a wax/resin formulation and is passed to a flash drier*'. The fibres subsequently '*pass from the four cyclones directly on to the mat forming station*'.

It is acknowledged by Kronospan that the wax/resin formulation referred to in section 1.4.3 of the Supporting Information contains Formaldehyde. However, Formaldehyde is not a halogenated compound, and it does not contain heavy metals. Taking this into consideration, Kronospan are not clear why NRW consider the reject material from MDF manufacturing to be non-exempt biomass, and the combustion of this reject material to be subject to the requirements of Chapter IV of IED.

To demonstrate this, Kronospan has undertaken trials to demonstrate that the concentrations of formaldehyde within the flue gas from the combustion of reject MDF are suitably low enough to confirm that the reject MDF should not be regulated at 'non-exempt' biomass in accordance with the definitions stated in Article 3, (31)(v).

The results from the trials we have undertaken will be provided in due course.

Kronospan can confirm that road sweepings are only deposited into the K8 boiler fuel compound. Therefore, these are not combusted within K7.

Finally, Kronospan can confirm that all sources of boiler fuel listed in item 1, are accounted for by the biomass descriptions in Table 1 of the procedure and have updated Table 1 to reflect the above, and also . The updated table is presented below.

Table 1

Biomass Type	**K7**	**K8**
Logs (referred to as Roundwood)	x	
Wood Chip	x	
Off-Specification Compost		
Recycled Cellulose Fibre (RCF) Grade A "Clean" recycled wood		
Sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04		x
Waste bark and wood	x	x
Wood other than that mentioned in 19 12 06		x
Recycled Cellulose Fibre (RCF) Grade B "Industrial" recycled wood		
Waste bark and wood		x
Wood other than that mentioned in 19 12 06		x
Wood other than that mentioned in 20 01 37		x

On-Site Process Wastes		
Fines from grading of RCF		x
Dusts from dust extraction systems		x
Off-cuts from the Saw Mill	x	x
Bark from the Saw Mill	x	x
Sawdust from the Sawmill	x	x
Reject material from manufacturing	x[1]	x
Solid residues from skimming of surface water run-off from internal roadways		x

[1] non-particleboard only

6 Emission Point numbering on site plan

The current site plan attached to the NRW permit shows the emission points on site, which are grouped and numbered according to regulator. Regulation of the whole site will switch to NRW as the single environmental regulator following the Welsh Government Direction published in March 2018. Please revise the site plan so that it matches this future scenario as follows:

i) Please remove the green shaded blocks from the plan as these denote discrete areas of the site previously regulated by NRW.

ii) In terms of the following emission points to air, the following numbering is suggested, which will match with the existing emission point numbering in the NRW permit:

A1 – A15 – existing emission points associated with chemical manufacturing, therefore no change required;

A16 – A25 – existing emission points associated with the gas-fired combustion plant, therefore no change required;

A26 – A27 – suggested for K7 and K8 biomass boilers, as these will appear in their own separate table of emission limits and monitoring requirements

A28 onwards – use for all remaining emission points associated with board manufacturing, which will also appear in a separate table. These emission points are currently:

- *SEKA WESP Unit Stack Exhaust from Particleboard Dryers 2 and 3;*
- *MDF 2 Dryers (open cyclones x 4);*
- *MDF 1 Dryer Cyclones;*
- *MDF 1, MDF 2 and Particleboard Contiroll combined*
- *Bab 2 Dryer*
- *Bab 3 Dryer – dedicated stack*

However, these emission point names shall also be updated to account for the new Particleboard WESP (which needs to be included as a new emission point) and changes to the press abatement release through the original Particleboard WESP. It is understood that "MDF1, MDF2 and Particleboard Contiroll combined" is now an emergency release point only and shall be included as such. In addition, the updated site plan shall include the new emission point associated with Chip Dryer 4.

iii) In addition, the various emission points to air associated with the bag filter plant (identified in Section 1, Air Quality modelling) shall be individually numbered on a separate site plan, to be included in the permit, as Site Plan 2. The legend for Site Plan 2 shall also be separate from the legend for Site Plan 1.

iv) Finally, Site Plan 1 shall be updated to show all emission points to Water (W1) and Sewer. The sewer emission point numbering shall start at S1 "Boiler blowdown (from Gas Engines 1 – 5) released to Middle Road Pit prior to final discharge to public sewer" and shall show all separate release points to sewer of process effluent on site.

The drawings as requested are presented in Appendix E.

Emission Points to Air

The emission point numbering has been amended on the site plan as requested. Kronospan has also reviewed the current emission points and have removed 2 points which do not release to atmosphere but feed directly back into the hopper, with the agreement of Julia Frost (Team Leader NRW) and Ian Oakes (Inspector NRW):

1. Dust Filter for Melamine Hopper Feeding Reactor R210 & R220
2. Dust Filter for Melamine Hopper Feeding Reactor No.4

Emission Points to Water

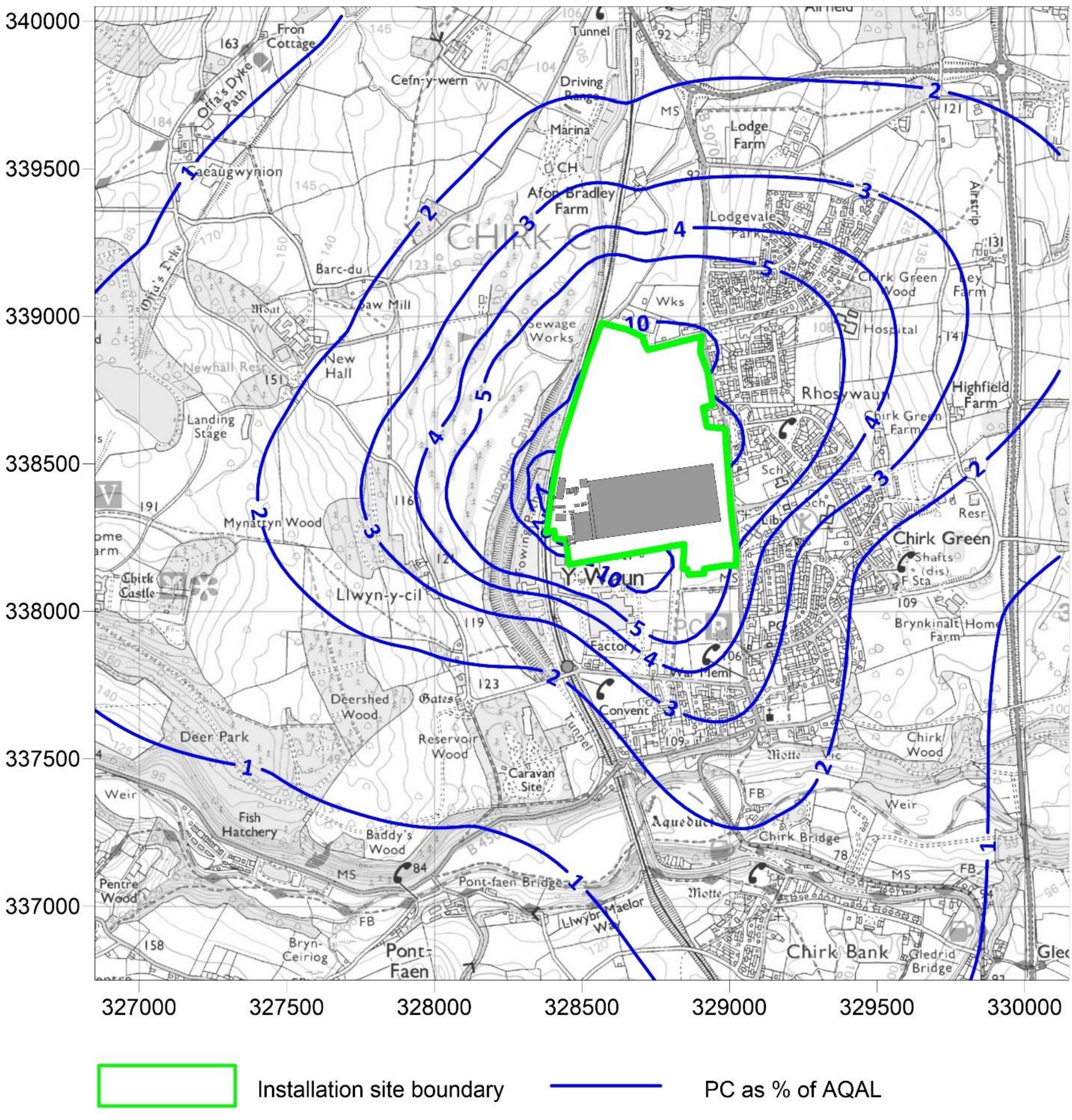
The emission point numbering for emissions to water has been updated. This includes Zones 1, 2, 3 to cover the Pre-production and Drier areas, which are currently under construction.

- Zone 1 is long established as the Middle Road pit discharge which now takes waters from the following areas:
  - Drier 2 & 3
  - WESP 32
  - Biomass Boiler waters
- Zone 2 – includes the pre-production area, sifters, mills, and bag filtration.
- Zone 3 – covers Drier 4 and WESP 21. Both zones will feed into the existing regulated discharge points. These discharge points have previously been discussed with Welsh Water, and new descriptions will need to be agreed and the consent documents amended in due course.

Appendices

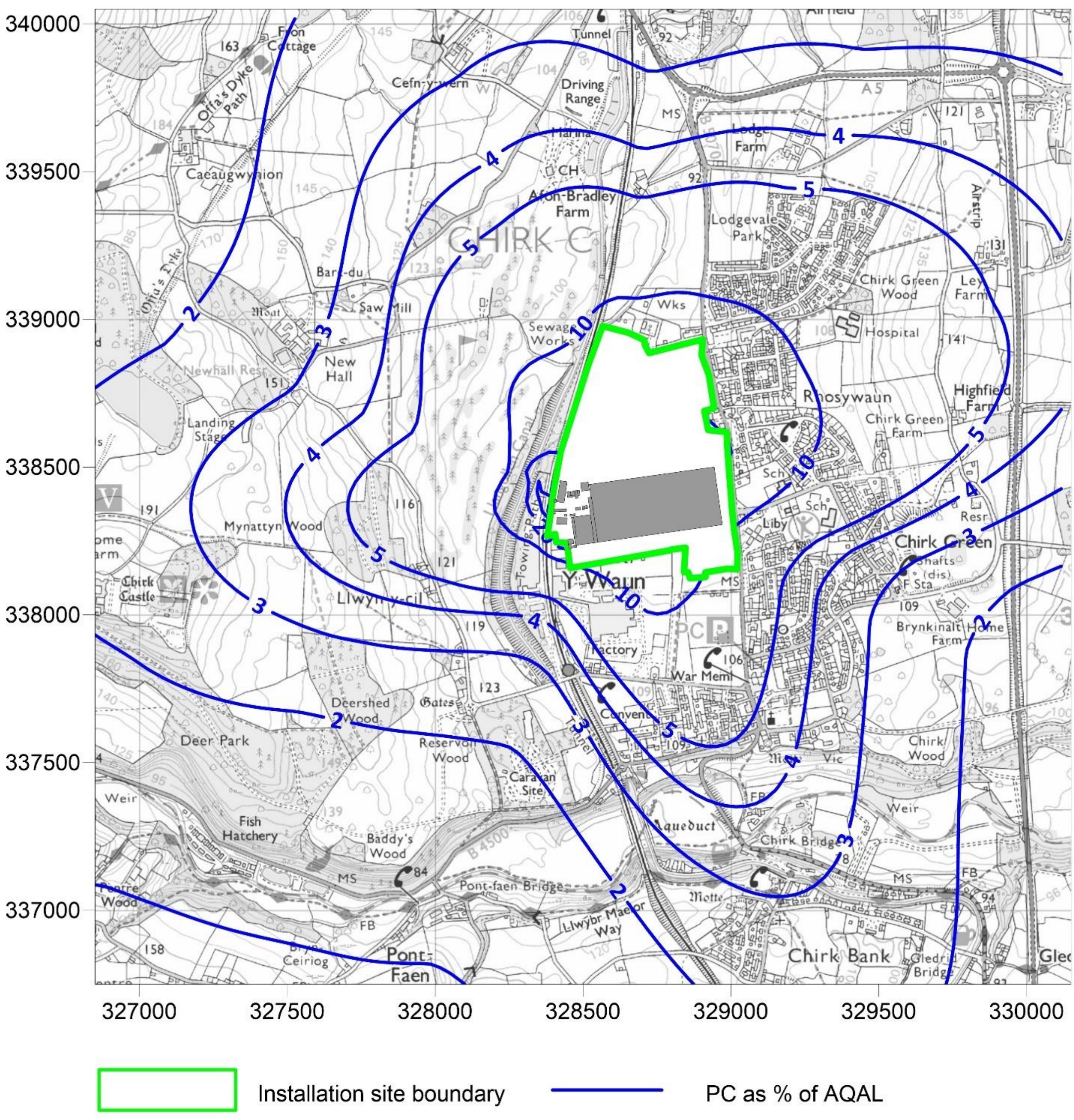
A Figures

Figure 1: Annual Mean PM10 Impact – Other Sources - % of AQAL



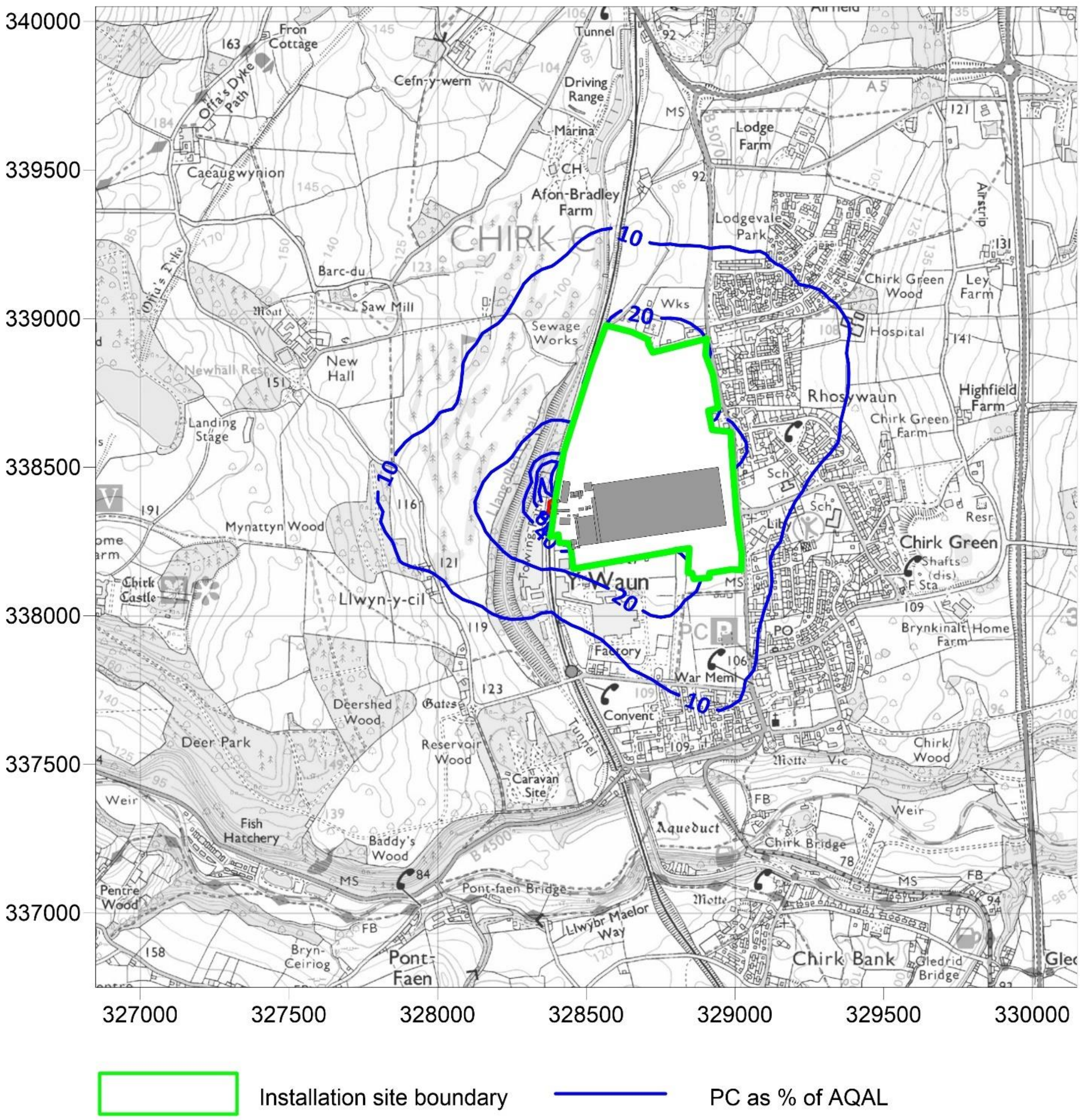
Notes: Assumes entire dust emissions are only PM10 and all sources are continually operating

Figure 2: Annual Mean PM10 Impact – Total Installation - % of AQAL



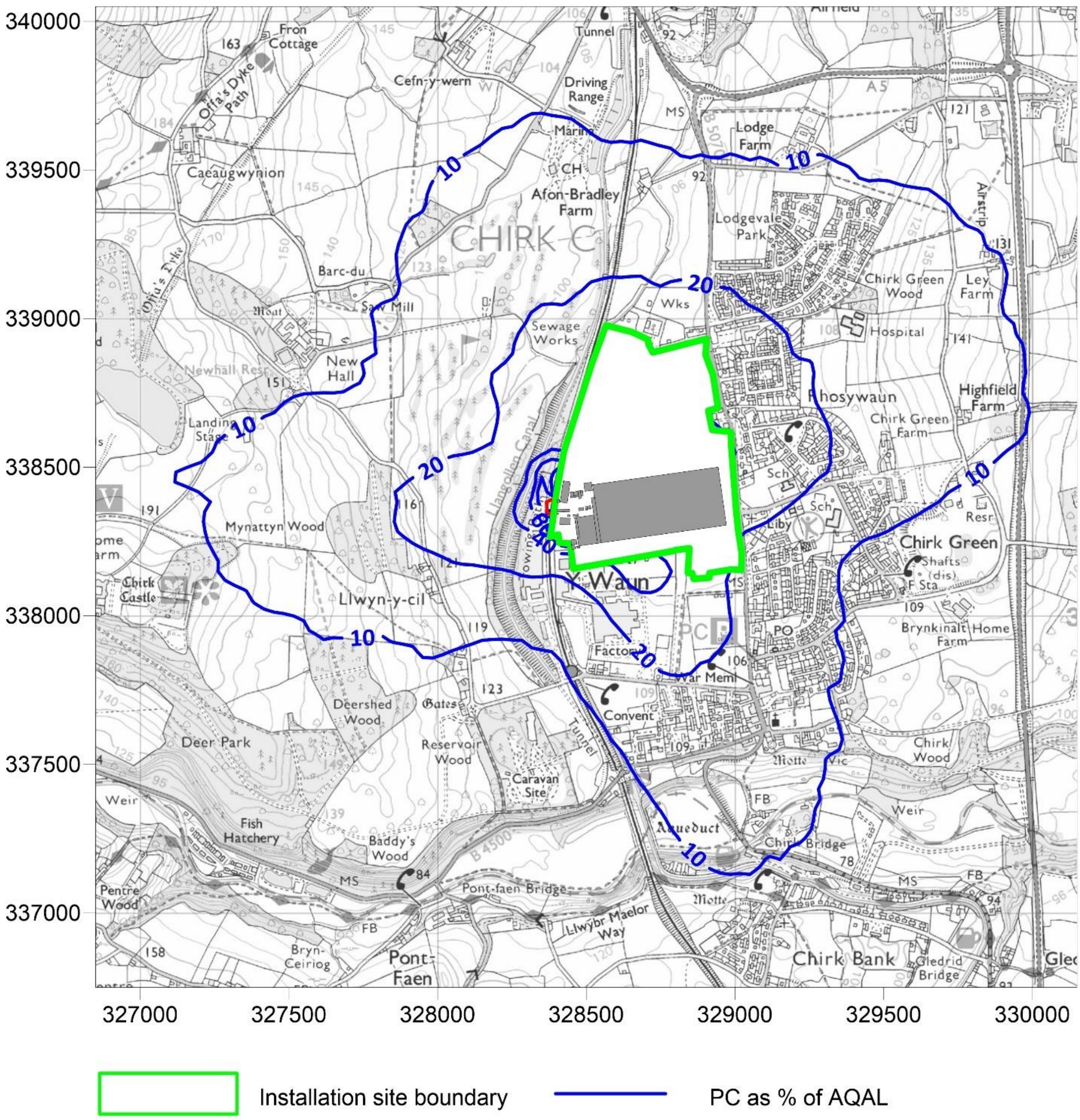
Notes: Assumes entire dust emissions are only PM10 and all sources are continually operating

Figure 3: Maximum Daily Mean PM10 Impact – Other Sources - % of AQAL



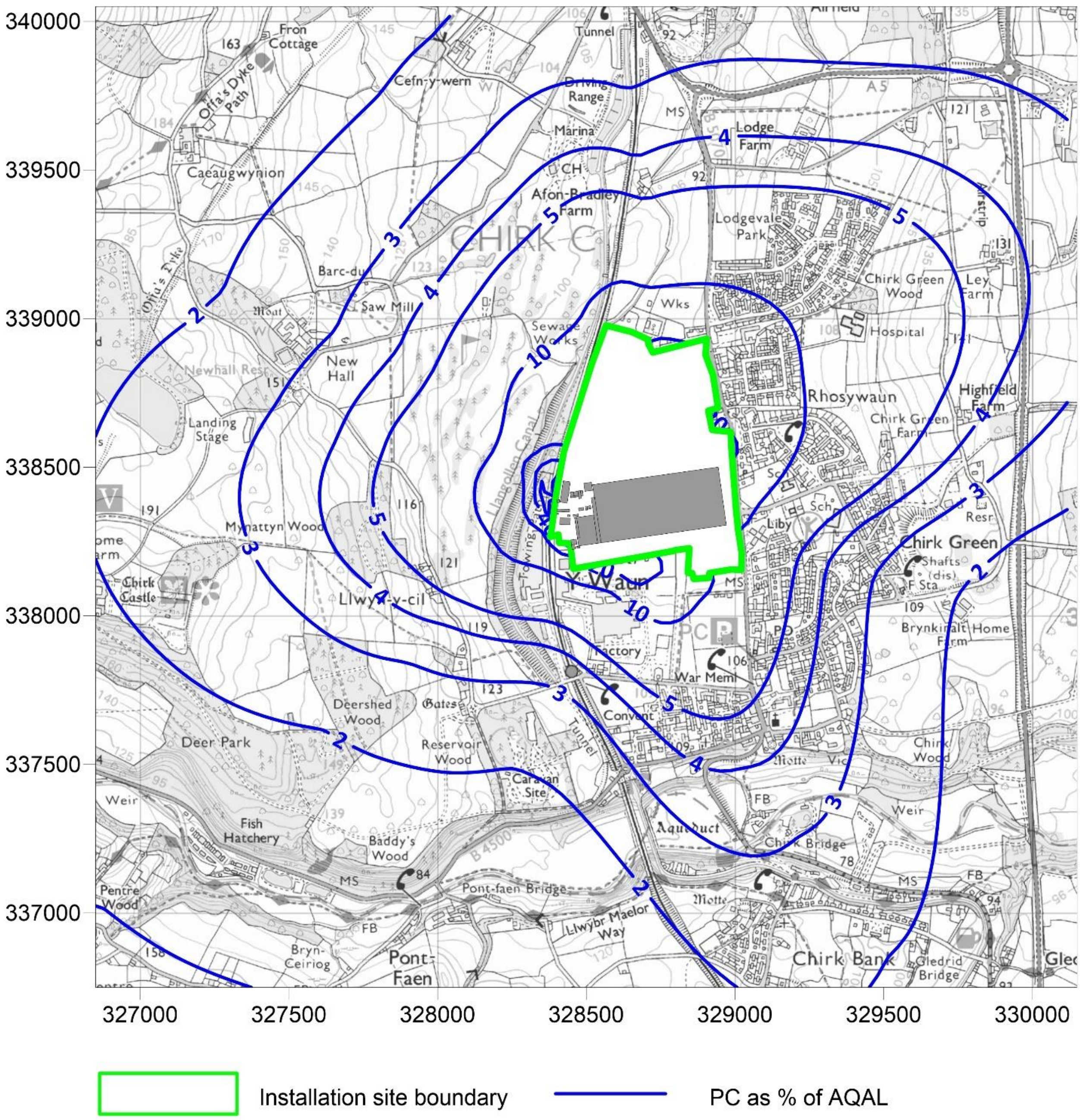
Notes: Assumes entire dust emissions are only PM10 and all sources are continually operating

Figure 4: Maximum Daily Mean PM10 Impact – Total Installation - % of AQAL



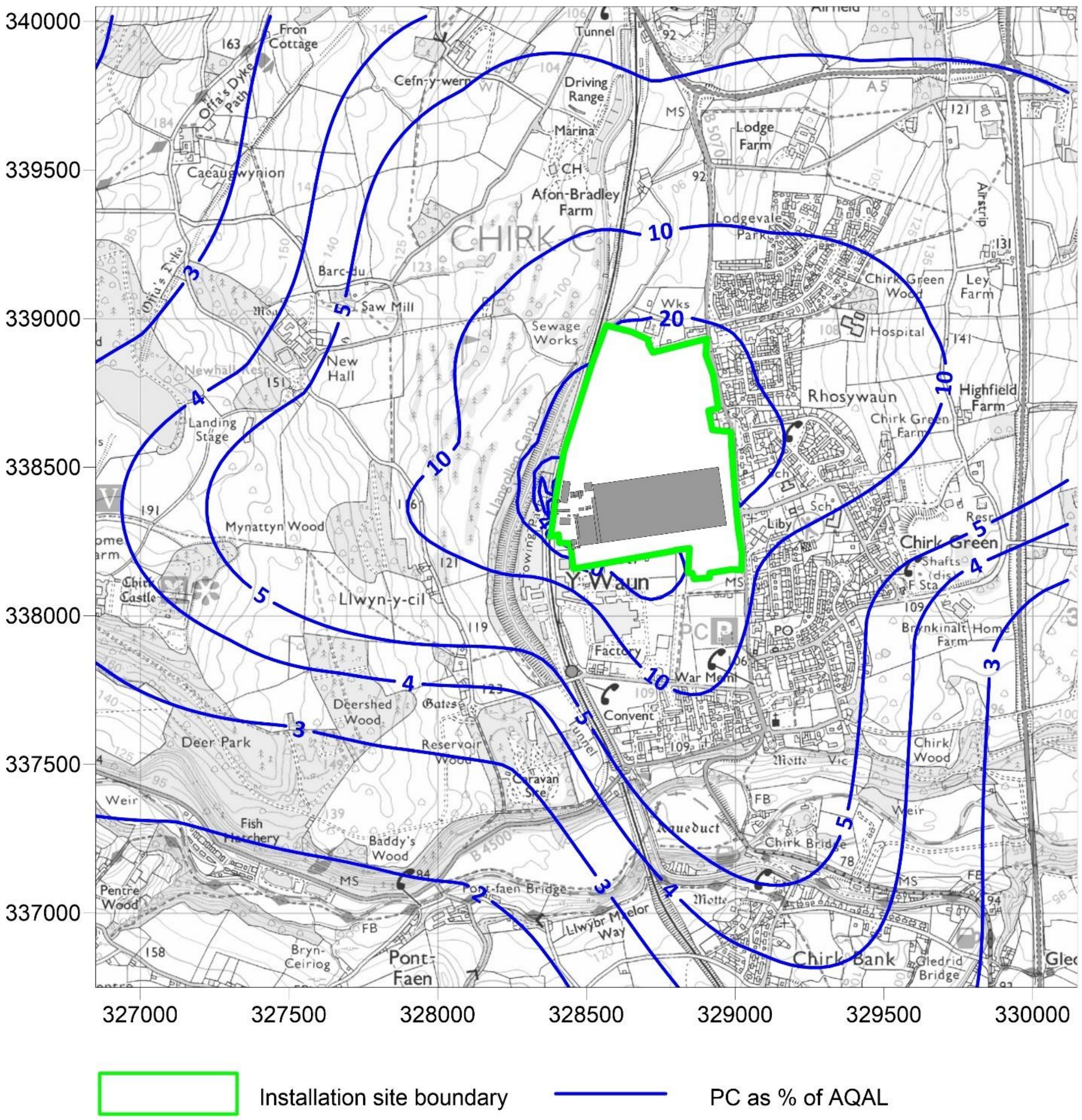
Notes: Assumes entire dust emissions are only PM10 and all sources are continually operating

Figure 5: Annual Mean PM2.5 Impact – Other Sources - % of AQAL



Notes: Assumes entire dust emissions are only PM2.5 and all sources are continually operating

Figure 6: Annual Mean PM2.5 Impact – Total Installation - % of AQAL



Notes: Assumes entire dust emissions are only PM2.5 and all sources are continually operating

B Additional PM Sources Model Inputs

Table 1: Additional PM Sources Model Inputs

Area	Height (m)	Diameter (m)	Volume (m^3/s)	PM Release rate (g/s)
MDF Finishing line sander	11.5	1.4	23.6	0.118
MF Finishing linke Kontra Saws	9.98	1.0	11.1	0.056
MDF 2 Cross Cut Saw and Hoggers	19.79	1.8	13.9	0.069
MDF 1 Cross Cut Saw and Hoggers	19.48	1.6	11.1	0.056
Old 246 De-dusting	33.15	1.5	5.6	0.028
Particle Board Sifter	9.4	1.3	8.3	0.042
Particle Board Sifter	4.6	0.4	1.7	0.008
Hamatec Dust Cleaning	5.25	0.8	8.3	0.042
Particle Board Core Layer De-dust	9.78	1.5	2.1	0.010
Particle Board Surface Layer De-dust	9.78	1.5	16.7	0.083
Particle Board Conidur De-dust	9.78	1.5	16.7	0.083
Particle Board Mat Former	16.51	1.4	8.3	0.042
Particle Board Sander	16.64	5.7	47.2	0.236
T&G	18.17	5.4	6.3	0.031
Particle Board Ferro	19.32	7.5	8.3	0.042
P1 MFC Press & Lathe Machine	21.67	1.5	16.7	0.083
P2 MFC Press	21.67	1.5	16.7	0.083
P3 MFC Press	20.35	1.5	5.6	0.028
P4 MFC Press	16.52	1.5	16.7	0.083
Particle Board Pre-screening	8.73	0.4	1.5	0.008
Chip Prep Building (Pallman Flakers)	13.2	0.9	6.3	0.031
Chip Prep Building (Hamermills)	13.2	1.6	25.0	0.125
Kronoplus Silo Filter	13.32	0.4	1.0	0.005
Worktop Line	12.28	1.3	16.7	0.083
Flooring Line No.2 & Selco Saw	9.98	2.3	33.3	0.167
Flooring Line No.1	11.23	1.8	27.8	0.139
Flooring Line No.3	11.28	1.8	25.0	0.125

Notes: Where the emission point is rectangular an effective stack diameter has been calculated. The PM emission rate has been calculated by multiplying the volumetric flow rate by the typical emission concentration of 5 mg/m^3

C Detailed Results Tables

Table 2: Ammonia Impact Analysis

Scenario	Quantity	Units	AQAL	Bg	Point of Maximum Impact				Maximum Impact Outside Installation Boundary			
					PC		PEC		PC		PEC	
					Conc.	As % of AQAL	Conc.	As % of AQAL	Conc.	As % of AQAL	Conc.	As % of AQAL
Normal Operations	Annual mean	µg/m^3	180	2.08	0.04	0.02%	2.12	1.18%	0.04	0.02%	2.12	1.18%
	Hourly mean	µg/m^3	2,500	4.16	1.85	0.07%	6.01	0.24%	1.85	0.07%	6.01	0.24%
MDF 1 and 2 Driers Offline	Annual mean	µg/m^3	180	2.08	0.03	0.01%	2.11	1.17%	0.03	0.01%	2.11	1.17%
	Hourly mean	µg/m^3	2,500	4.16	1.82	0.07%	5.98	0.24%	1.82	0.07%	5.98	0.24%

NOTE:
Background concentration from 2014 mapped background dataset for the grid square containing the Facility
Short term background concentration assumed to be two times the long term background concentration

Table 3: Annual Mean Ammonia Impact Analysis at Ecological Receptors

Receptor	Bg	PC (as % of CL)		PEC (as % of CL)	
		Normal	MDF 2 Offline	Normal	MDF 2 Offline
River Dee and Bala Lake	4.60	0.4%	0.4%	153.8%	153.8%
Johnstown Newt Sites	2.83	0.05%	0.05%	94.4%	94.4%
Berwyn and South Clwyd Mountains *	1.96	0.14%	0.14%	196.1%	196.1%
Berwyn	1.52	0.03%	0.03%	50.7%	50.7%
Chirk Castle *	2.08	2.1%	2.1%	210.1%	210.1%
Nant-y-Belan and Prynela Woods *	2.71	0.6%	0.6%	271.6%	271.6%
Pentri Wood *	2.08	0.3%	0.3%	208.3%	208.3%
Brynkinalt *	2.67	0.5%	0.5%	267.5%	267.5%
NOTES: * Assumes Critical Level of lichen sensitive communities applies. Background concentrations downloaded from APIS for the maximum across each site.					

Note the impact is the same for normal operations and MDF 2 offline as the source of ammonia (the K8 biomass plant) is emitted from MDF1 under normal operations and K8 biomass plant would continue to emit via MDF 1 drier when the MDF 2 drier is offline. Results have been presented for both scenarios to align with the results presented in the air quality assessment.

Table 4: Max Daily Mean NOx Impact Analysis at Ecological Receptors – Likely Case – UPDATED

Receptor	Bg	PC (as % of CL)		PEC (as % of CL)	
		Normal	MDF 2 Offline	Normal	MDF 2 Offline
River Dee and Bala Lake	16.6	25.9%	21.8%	48.1%	44.0%
Johnstown Newt Sites	17.3	2.6%	2.1%	25.6%	25.1%
Berwyn and South Clwyd Mountains	11.7	3.8%	2.8%	19.4%	18.5%
Berwyn	7.9	2.6%	2.1%	13.2%	12.7%
Chirk Castle	11.5	43.1%	46.1%	58.5%	61.5%
Nant-y-Belan and Prynela Woods	11.5	8.1%	6.4%	23.4%	21.7%
Pentri Wood	11.3	13.6%	10.3%	28.6%	25.3%
Brynkinalt	8.98	8.9%	7.3%	20.9%	19.3%
NOTE: The PEC presented in the air quality assessment was incorrect, this has been updated.					

Table 5: Annual Mean NOx Impact Analysis at Ecological Receptors – Worst Case

Receptor	Bg	PC (as % of CL)		PEC (as % of CL)	
		Normal	MDF 2 Offline	Normal	MDF 2 Offline
River Dee and Bala Lake	16.6	12.8%	9.1%	68.2%	64.5%
Johnstown Newt Sites	17.3	1.8%	1.3%	59.4%	58.9%
Berwyn and South Clwyd Mountains	11.7	1.8%	1.3%	40.8%	40.3%
Berwyn	7.9	1.3%	0.9%	27.7%	27.4%
Chirk Castle	11.5	18.9%	16.5%	57.3%	55.0%
Nant-y-Belan and Prynela Woods	11.5	6.9%	5.2%	45.3%	43.6%
Pentri Wood	11.3	3.1%	2.3%	40.7%	39.9%
Brynkinalt	8.98	5.1%	3.8%	35.0%	33.8%

Table 6: Max Daily Mean NOx Impact Analysis at Ecological Receptors – Worst Case

Receptor	Bg	PC (as % of CL)		PEC (as % of CL)	
		Normal	MDF 2 Offline	Normal	MDF 2 Offline
River Dee and Bala Lake	16.6	64.7%	47.4%	86.9%	69.5%
Johnstown Newt Sites	17.3	6.3%	4.7%	29.4%	27.7%
Berwyn and South Clwyd Mountains	11.7	9.4%	6.6%	25.0%	22.3%
Berwyn	7.9	6.6%	4.8%	17.1%	15.3%
Chirk Castle	11.5	107.5%	101.7%	122.9%	117.0%
Nant-y-Belan and Prynela Woods	11.5	20.1%	14.7%	35.4%	30.0%
Pentri Wood	11.3	33.8%	23.8%	48.8%	38.8%
Brynkinalt	8.98	22.2%	16.5%	34.2%	28.5%

Table 7: Ecological Results – For Deposition Analysis – Likely Case

Receptor	Annual Mean PC - µg/m^3			
	NOx – Likely Case	SO2	HCl	NH3
Normal Operations				
River Dee and Bala Lake	1.54	0.396	0.013	0.013
Johnstown Newt Sites	0.22	0.052	0.001	0.001
Berwyn and South Clwyd Mountains	0.21	0.050	0.001	0.001
Berwyn	0.16	0.037	0.001	0.001

Receptor	Annual Mean PC - µg/m³			
Chirk Castle	0.16	0.037	0.001	0.001
Nant-y-Belan and Prynela Woods	2.27	0.422	0.021	0.021
Pentri Wood	2.27	0.422	0.021	0.021
Brynkinalt	0.83	0.184	0.006	0.006
MDF 2 Offline				
River Dee and Bala Lake	1.22	0.562	0.013	0.013
Johnstown Newt Sites	0.17	0.060	0.001	0.001
Berwyn and South Clwyd Mountains	0.17	0.060	0.001	0.001
Berwyn	0.12	0.044	0.001	0.001
Chirk Castle	0.12	0.044	0.001	0.001
Nant-y-Belan and Prynela Woods	2.27	0.882	0.021	0.021
Pentri Wood	2.27	0.882	0.021	0.021
Brynkinalt	0.69	0.236	0.006	0.006

Table 8: Ecological Results – For Deposition Analysis – Worst-Case

Receptor	Annual Mean PC - µg/m³			
	NOx – Worst Case	SO2	HCl	NH3
Normal Operations				
River Dee and Bala Lake	3.83	0.396	0.013	0.013
Johnstown Newt Sites	0.55	0.052	0.001	0.001
Berwyn and South Clwyd Mountains	0.53	0.050	0.001	0.001
Berwyn	0.39	0.037	0.001	0.001
Chirk Castle	0.39	0.037	0.001	0.001
Nant-y-Belan and Prynela Woods	5.66	0.422	0.021	0.021
Pentri Wood	5.66	0.422	0.021	0.021
Brynkinalt	2.07	0.184	0.006	0.006
MDF 2 Offline				
River Dee and Bala Lake	2.73	0.562	0.013	0.013
Johnstown Newt Sites	0.40	0.060	0.001	0.001
Berwyn and South Clwyd Mountains	0.39	0.060	0.001	0.001
Berwyn	0.28	0.044	0.001	0.001
Chirk Castle	0.28	0.044	0.001	0.001
Nant-y-Belan and Prynela Woods	4.96	0.882	0.021	0.021
Pentri Wood	4.96	0.882	0.021	0.021
Brynkinalt	1.55	0.236	0.006	0.006

Table 9: Ecological Results – N Deposition – Likely Case

Receptor	CL Class	kgN/ha/yr			Deposition Velocity	Min CL		Max CL	
		Min CL	Max CL	Bg		PC as % of min CL	PEC as % of min CL	PC as % of max CL	PEC as % of max CL
Normal Operations									
River Dee	No CL	-	-	-	Grassland	-	-	-	-
Johnstown Newt Site	No CL	-	-	-	Grassland	-	-	-	-
Beryn Mountains	Blanket bogs	5	10	21.7	Grassland	0.6%	434.6%	0.3%	217.3%
Berwyn	Broadleaved woodlands	10	20	35.14	Woodland	0.4%	351.8%	0.2%	175.9%
Berwyn	Dwarf shrub heath	10	20	23.94	Grassland	0.2%	239.6%	0.1%	119.8%
Chirk Castle SSSI	Broadleaved woodlands	10	20	34.02	Woodland	6.2%	346.4%	3.1%	173.2%
Chirk Castle SSSI	Grassland	20	30	22.26	Grassland	1.7%	113.0%	1.1%	75.3%
Nant-y-Belan and Prynela Woods	Broadleaved woodlands	10	20	36.68	Woodland	2.1%	368.9%	1.1%	184.5%
Pentri Wood	Broadleaved woodlands	10	20	34.02	Woodland	1.0%	341.2%	0.5%	170.6%
Brynkinalt	Broadleaved woodlands	10	20	37.38	Woodland	1.6%	375.4%	0.8%	187.7%
MDF 2 Offline									
River Dee	No CL	-	-	-	Grassland	-	-	-	-
Johnstown Newt Site	No CL	-	-	-	Grassland	-	-	-	-
Beryn Mountains	Blanket bogs	5	10	21.7	Grassland	0.5%	434.5%	0.2%	217.2%
Berwyn	Broadleaved woodlands	10	20	35.14	Woodland	0.3%	351.7%	0.2%	175.9%
Berwyn	Dwarf shrub heath	10	20	23.94	Grassland	0.2%	239.6%	0.1%	119.8%
Chirk Castle SSSI	Broadleaved woodlands	10	20	34.02	Woodland	6.2%	346.4%	3.1%	173.2%
Chirk Castle SSSI	Grassland	20	30	22.26	Grassland	1.7%	113.0%	1.1%	75.3%
Nant-y-Belan and Prynela Woods	Broadleaved woodlands	10	20	36.68	Woodland	1.8%	368.6%	0.9%	184.3%
Pentri Wood	Broadleaved woodlands	10	20	34.02	Woodland	0.8%	341.0%	0.4%	170.5%
Brynkinalt	Broadleaved woodlands	10	20	37.38	Woodland	1.5%	375.5%	0.7%	187.6%

Table 10: Ecological Results – Acid Deposition – min CL Analysis – Likely Case

Receptor	CL Class	kgN/ha/yr					Deposition Velocity	Min CL	
		Min CL	Max S	Max N	Bg N	Bg S		PC as % of min CL	PEC as % of min CL
Normal Operations									
River Dee	-	-	-	-	-	-	Grassland	-	-
Johnstown Newt Site	-	-	-	-	-	-	Grassland	-	-
Beryn Mountains	Blanket bog	0.178	0.23	0.551	1.55	0.29	Grassland	1.6%	335.5%
Beryn Mountains	Dry grassland	0.856	4	4.856	1.5	0.4	Grassland	0.2%	39.3%
Beryn Mountains	European dry heaths	0.499	0.23	0.882	1.5	0.4	Grassland	1.0%	216.4%
Beryn Mountains	Upland calcareous rocky slopes	0.178	0.23	0.551	1.5	0.4	Grassland	1.6%	346.4%
Berwyn	Broadleaved woodlands	0.142	0.654	0.894	2.51	0.45	Woodland	1.4%	332.5%
Berwyn	Dwarf shrub heath	0.642	0.5	1.142	1.71	0.35	Grassland	0.6%	180.9%
Chirk Castle SSSI	Broadleaved woodlands	0.142	1.731	1.873	2.43	0.28	Woodland	8.8%	153.5%
Chirk Castle SSSI	Grassland	0.856	4	4.856	1.59	0.24	Grassland	1.7%	39.4%
Woods	Broadleaved woodlands	0.357	1.522	1.879	2.62	0.27	Woodland	3.4%	157.2%
Woodland	Broadleaved woodlands	0.142	1.731	1.873	2.43	0.28	Woodland	1.7%	146.4%
Brynkinalt	Broadleaved woodlands	0.142	1.637	1.779	2.67	0.32	Woodland	2.9%	171.0%
MDF 2 Offline									
River Dee	-	-	-	-	-	-	Grassland	-	-
Johnstown Newt Site	-	-	-	-	-	-	Grassland	-	-
Beryn Mountains	Blanket bog	0.178	0.23	0.551	1.55	0.29	Grassland	1.7%	335.7%
Beryn Mountains	Dry grassland	0.856	4	4.856	1.5	0.4	Grassland	0.2%	39.3%
Beryn Mountains	European dry heaths	0.499	0.23	0.882	1.5	0.4	Grassland	1.1%	216.5%
Beryn Mountains	Upland calcareous rocky slopes	0.178	0.23	0.551	1.5	0.4	Grassland	1.7%	346.5%
Berwyn	Broadleaved woodlands	0.142	0.654	0.894	2.51	0.45	Woodland	1.5%	332.6%
Berwyn	Dwarf shrub heath	0.642	0.5	1.142	1.71	0.35	Grassland	0.6%	181.0%
Chirk Castle SSSI	Broadleaved woodlands	0.142	1.731	1.873	2.43	0.28	Woodland	14.6%	159.3%
Chirk Castle SSSI	Grassland	0.856	4	4.856	1.59	0.24	Grassland	2.8%	40.5%
Woods	Broadleaved woodlands	0.357	1.522	1.879	2.62	0.27	Woodland	4.0%	157.8%
Woodland	Broadleaved woodlands	0.142	1.731	1.873	2.43	0.28	Woodland	2.1%	146.8%
Brynkinalt	Broadleaved woodlands	0.142	1.637	1.779	2.67	0.32	Woodland	3.8%	171.9%

Table 11: Ecological Results – Acid Deposition – max CL Analysis – Likely Case

Receptor	CL Class	kgN/ha/yr					Deposition Velocity	Max CL	
		Min CL	Max S	Max N	Bg N	Bg S		PC as % of min CL	PEC as % of min CL
Normal Operations									
River Dee	-	-	-	-	-	-	Grassland	-	-
Johnstown Newt Site	-	-	-	-	-	-	Grassland	-	-
Beryn Mountains	Blanket bog	0.321	1.046	1.367	1.55	0.29	Grassland	0.6%	135.2%
Beryn Mountains	Dry grassland	1.214	4.058	5.252	1.5	0.4	Grassland	0.2%	36.3%
Beryn Mountains	European dry heaths	1.107	4.18	5.072	1.5	0.4	Grassland	0.2%	37.6%
Beryn Mountains	Upland calcareous rocky slopes	0.536	4.18	4.358	1.5	0.4	Grassland	0.2%	43.8%
Berwyn	Broadleaved woodlands	0.5	3.576	3.933	2.51	0.45	Woodland	0.3%	75.6%
Berwyn	Dwarf shrub heath	1.17	1.76	2.837	1.71	0.35	Grassland	0.2%	72.8%
Chirk Castle SSSI	Broadleaved woodlands	-	-	-	2.43	0.28	Woodland	-	-
Chirk Castle SSSI	Grassland	-	-	-	1.59	0.24	Grassland	-	-
Woods	Broadleaved woodlands	-	-	-	2.62	0.27	Woodland	-	-
Woodland	Broadleaved woodlands	-	-	-	2.43	0.28	Woodland	-	-
Brynkinalt	Broadleaved woodlands	-	-	-	2.67	0.32	Woodland	-	-
MDF 2 Offline									
River Dee	-	-	-	-	-	-	Grassland	-	-
Johnstown Newt Site	-	-	-	-	-	-	Grassland	-	-
Beryn Mountains	Blanket bog	0.321	1.046	1.367	1.55	0.29	Grassland	0.7%	135.3%
Beryn Mountains	Dry grassland	1.214	4.058	5.252	1.5	0.4	Grassland	0.2%	36.4%
Beryn Mountains	European dry heaths	1.107	4.18	5.072	1.5	0.4	Grassland	0.2%	37.6%
Beryn Mountains	Upland calcareous rocky slopes	0.536	4.18	4.358	1.5	0.4	Grassland	0.2%	43.8%
Berwyn	Broadleaved woodlands	0.5	3.576	3.933	2.51	0.45	Woodland	0.3%	75.6%
Berwyn	Dwarf shrub heath	1.17	1.76	2.837	1.71	0.35	Grassland	0.2%	72.9%
Chirk Castle SSSI	Broadleaved woodlands	-	-	-	2.43	0.28	Woodland	-	-
Chirk Castle SSSI	Grassland	-	-	-	1.59	0.24	Grassland	-	-
Woods	Broadleaved woodlands	-	-	-	2.62	0.27	Woodland	-	-
Woodland	Broadleaved woodlands	-	-	-	2.43	0.28	Woodland	-	-
Brynkinalt	Broadleaved woodlands	-	-	-	2.67	0.32	Woodland	-	-

Table 12: Ecological Results – N Deposition – Worst Case

Receptor	CL Class	kgN/ha/yr			Deposition Velocity	Min CL		Max CL	
		Min CL	Max CL	Bg		PC as % of min CL	PEC as % of min CL	PC as % of max CL	PEC as % of max CL
Normal Operations									
River Dee	No CL				Grassland	-	-	-	-
Johnstown Newt Site	No CL				Grassland	-	-	-	-
Beryn Mountains	Blanket bogs	5	10	21.7	Grassland	1.2%	435.2%	0.1%	217.1%
Berwyn	Broadleaved woodlands	10	20	35.14	Woodland	0.9%	352.3%	0.04%	175.7%
Berwyn	Dwarf shrub heath	10	20	23.94	Grassland	0.4%	239.8%	0.02%	119.7%
Chirk Castle SSSI	Broadleaved woodlands	10	20	34.02	Woodland	13.0%	353.2%	0.6%	170.7%
Chirk Castle SSSI	Grassland	20	30	22.26	Grassland	3.4%	114.7%	0.1%	74.3%
Nant-y-Belan and Prynela Woods	Broadleaved woodlands	10	20	36.68	Woodland	4.6%	371.4%	0.2%	183.6%
Pentri Wood	Broadleaved woodlands	10	20	34.02	Woodland	2.1%	342.3%	0.1%	170.2%
Brynkinalt	Broadleaved woodlands	10	20	37.38	Woodland	3.5%	377.3%	0.2%	187.1%
MDF 2 Offline									
River Dee	No CL				Grassland	-	-	-	-
Johnstown Newt Site	No CL				Grassland	-	-	-	-
Beryn Mountains	Blanket bogs	5	10	21.7	Grassland	0.9%	434.9%	0.1%	217.1%
Berwyn	Broadleaved woodlands	10	20	35.14	Woodland	0.6%	352.0%	0.03%	175.7%
Berwyn	Dwarf shrub heath	10	20	23.94	Grassland	0.3%	239.7%	0.02%	119.7%
Chirk Castle SSSI	Broadleaved woodlands	10	20	34.02	Woodland	11.6%	351.8%	0.6%	170.7%
Chirk Castle SSSI	Grassland	20	30	22.26	Grassland	3.0%	114.3%	0.1%	74.3%
Nant-y-Belan and Prynela Woods	Broadleaved woodlands	10	20	36.68	Woodland	3.6%	370.4%	0.2%	183.6%
Pentri Wood	Broadleaved woodlands	10	20	34.02	Woodland	1.6%	341.8%	0.1%	170.2%
Brynkinalt	Broadleaved woodlands	10	20	37.38	Woodland	2.7%	376.5%	0.1%	187.0%

Table 13: Ecological Results – Acid Deposition – min CL Analysis – Worst Case

Receptor	CL Class	kgN/ha/yr					Deposition Velocity	Min CL	
		Min CL	Max S	Max N	Bg N	Bg S		PC as % of min CL	PEC as % of min CL
Normal Operations									
River Dee	-	-	-	-	-	-	Grassland	-	-
Johnstown Newt Site	-	-	-	-	-	-	Grassland	-	-
Beryn Mountains	Blanket bog	0.178	0.23	0.551	1.55	0.29	Grassland	2.0%	335.9%
Beryn Mountains	Dry grassland	0.856	4	4.856	1.5	0.4	Grassland	0.2%	39.4%
Beryn Mountains	European dry heaths	0.499	0.23	0.882	1.5	0.4	Grassland	1.2%	216.6%
Beryn Mountains	Upland calcareous rocky slopes	0.178	0.23	0.551	1.5	0.4	Grassland	2.0%	346.8%
Berwyn	Broadleaved woodlands	0.142	0.654	0.894	2.51	0.45	Woodland	1.8%	332.9%
Berwyn	Dwarf shrub heath	0.642	0.5	1.142	1.71	0.35	Grassland	0.7%	181.1%
Chirk Castle SSSI	Broadleaved woodlands	0.142	1.731	1.873	2.43	0.28	Woodland	11.4%	156.1%
Chirk Castle SSSI	Grassland	0.856	4	4.856	1.59	0.24	Grassland	2.2%	39.9%
Nant-y-Belan and Prynela Woods	Broadleaved woodlands	0.357	1.522	1.879	2.62	0.27	Woodland	4.4%	158.2%
Pentri Wood	Broadleaved woodlands	0.142	1.731	1.873	2.43	0.28	Woodland	2.1%	146.8%
Brynkinalt	Broadleaved woodlands	0.142	1.637	1.779	2.67	0.32	Woodland	3.7%	171.7%
MDF 2 Offline									
River Dee	-	-	-	-	-	-	Grassland	-	-
Johnstown Newt Site	-	-	-	-	-	-	Grassland	-	-
Beryn Mountains	Blanket bog	0.178	0.23	0.551	1.55	0.29	Grassland	2.0%	335.9%
Beryn Mountains	Dry grassland	0.856	4	4.856	1.5	0.4	Grassland	0.2%	39.4%
Beryn Mountains	European dry heaths	0.499	0.23	0.882	1.5	0.4	Grassland	1.2%	216.7%
Beryn Mountains	Upland calcareous rocky slopes	0.178	0.23	0.551	1.5	0.4	Grassland	2.0%	346.8%
Berwyn	Broadleaved woodlands	0.142	0.654	0.894	2.51	0.45	Woodland	1.8%	332.9%
Berwyn	Dwarf shrub heath	0.642	0.5	1.142	1.71	0.35	Grassland	0.7%	181.1%
Chirk Castle SSSI	Broadleaved woodlands	0.142	1.731	1.873	2.43	0.28	Woodland	16.7%	161.4%
Chirk Castle SSSI	Grassland	0.856	4	4.856	1.59	0.24	Grassland	3.2%	40.9%
Nant-y-Belan and Prynela Woods	Broadleaved woodlands	0.357	1.522	1.879	2.62	0.27	Woodland	4.6%	158.4%
Pentri Wood	Broadleaved woodlands	0.142	1.731	1.873	2.43	0.28	Woodland	2.4%	147.1%
Brynkinalt	Broadleaved woodlands	0.142	1.637	1.779	2.67	0.32	Woodland	4.4%	172.4%

Table 14: Ecological Results – Acid Deposition – max CL Analysis – Worst Case

Receptor	CL Class	kgN/ha/yr					Deposition Velocity	Max CL	
		Min CL	Max S	Max N	Bg N	Bg S		PC as % of min CL	PEC as % of min CL
Normal Operations									
River Dee	-	-	-	-	-	-	Grassland	-	-
Johnstown Newt Site	-	-	-	-	-	-	Grassland	-	-
Beryn Mountains	Blanket bog	0.321	1.046	1.367	1.55	0.29	Grassland	0.8%	135.4%
Beryn Mountains	Dry grassland	1.214	4.058	5.252	1.5	0.4	Grassland	0.2%	36.4%
Beryn Mountains	European dry heaths	1.107	4.18	5.072	1.5	0.4	Grassland	0.2%	37.7%
Beryn Mountains	Upland calcareous rocky slopes	0.536	4.18	4.358	1.5	0.4	Grassland	0.2%	43.8%
Berwyn	Broadleaved woodlands	0.5	3.576	3.933	2.51	0.45	Woodland	0.4%	75.7%
Berwyn	Dwarf shrub heath	1.17	1.76	2.837	1.71	0.35	Grassland	0.3%	72.9%
Chirk Castle SSSI	Broadleaved woodlands	-	-	-	2.43	0.28	Woodland	-	-
Chirk Castle SSSI	Grassland	-	-	-	1.59	0.24	Grassland	-	-
Nant-y-Belan and Prynela Woods	Broadleaved woodlands	-	-	-	2.62	0.27	Woodland	-	-
Pentri Wood	Broadleaved woodlands	-	-	-	2.43	0.28	Woodland	-	-
Brynkinalt	Broadleaved woodlands	-	-	-	2.67	0.32	Woodland	-	-
MDF 2 Offline									
River Dee	-	-	-	-	-	-	Grassland	-	-
Johnstown Newt Site	-	-	-	-	-	-	Grassland	-	-
Beryn Mountains	Blanket bog	0.321	1.046	1.367	1.55	0.29	Grassland	0.8%	135.4%
Beryn Mountains	Dry grassland	1.214	4.058	5.252	1.5	0.4	Grassland	0.2%	36.4%
Beryn Mountains	European dry heaths	1.107	4.18	5.072	1.5	0.4	Grassland	0.2%	37.7%
Beryn Mountains	Upland calcareous rocky slopes	0.536	4.18	4.358	1.5	0.4	Grassland	0.3%	43.9%
Berwyn	Broadleaved woodlands	0.5	3.576	3.933	2.51	0.45	Woodland	0.4%	75.7%
Berwyn	Dwarf shrub heath	1.17	1.76	2.837	1.71	0.35	Grassland	0.3%	72.9%
Chirk Castle SSSI	Broadleaved woodlands	-	-	-	2.43	0.28	Woodland	-	-
Chirk Castle SSSI	Grassland	-	-	-	1.59	0.24	Grassland	-	-
Nant-y-Belan and Prynela Woods	Broadleaved woodlands	-	-	-	2.62	0.27	Woodland	-	-
Pentri Wood	Broadleaved woodlands	-	-	-	2.43	0.28	Woodland	-	-
Brynkinalt	Broadleaved woodlands	-	-	-	2.67	0.32	Woodland	-	-

D Proposed Oriented Strand Board (OSB) Production – Operating Techniques & BAT Assessment

Kronospan has reviewed the proposed OSB production against the BAT Conclusions contained within the EU BAT Reference Document for the Production of Wood Based Panels.

The proposed operating techniques are currently in the design stage with multiple manufacturers and final decisions are yet to be made regarding certain aspects (e.g. selection of resin type(s) for use in OSB). Where there is ambiguity in the techniques all possible options have been explored. Throughout the decision-making process the company will be following its management of change procedure to ensure that all potential environmental aspects (among others) are considered. Industry experts and specialist manufacturers are being consulted throughout the design process to ensure that the optimum final decision is made.

Kronospan will endeavour to keep Natural Resources Wales updated throughout the decision-making process.

The following review should be read in conjunction with the previous BAT assessment for the site, as submitted in Appendix D of the current permit variation application EPR/BW9999IG/V008. Much of the proposed processes are similar to those currently in operation at the site and as such much of the previous review remains valid.

The compliance categories remain the same for continuity:

Category	Explanation
1	Operations are fully compliant (in the case of OSB, will be fully compliant upon commencement of the process)
2	Operations will be fully compliant by the review date of 20 November 2019
3	Operations will be compliant, but not until a date after 20 November 2019
4	Operations will not be able to comply at all

Compliance categories 2 and 3 are null for this review due to the time required for planning approval, construction, and commissioning of the proposed plant.

D.1 General Best Available Techniques

D.1.1 Environmental Management System

BAT 1. In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the following features:

I. Commitment of the management, including senior management;

II. Definition of an environmental policy that includes the continuous improvement of the installation by the management;

III. Planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment;

IV. Implementation of procedures paying particular attention to:

(a) Structure and responsibility,

(b) Recruitment, training, awareness and competence,
(c) Communication,
(d) Employee involvement,
(e) Documentation,
(f) Effective process control,
(g) Maintenance programmes,
(h) Emergency preparedness and response,
(I) safeguarding compliance with environmental legislation;

V. Checking performance and taking corrective action, paying particular attention to:
(a) Monitoring and measurement (see also the Reference Report on Monitoring),
(b) Corrective and preventive action,
(c) Maintenance of records,
(d) independent (where practicable) internal and external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained;

VI. Review of the EMS and its continuing suitability, adequacy and effectiveness by senior management;
VII. Following the development of cleaner technologies;
VIII. Consideration for the environmental impacts from the eventual decommissioning of the installation at the stage of designing a new plant, and throughout its operating life;
IX. Application of sectoral benchmarking on a regular basis;
X. Waste management plan; (see BAT 11)
XI. Quality control plan for recovered wood used as raw material for panels and used as a fuel; (see BAT 2b)
XII. Noise management plan; (see BAT 4)
XIII. Odour management plan; (see BAT 9)
XIV. Dust management plan. (see BAT 23)

The previous response remains valid. The site's EMS will be expanded to incorporate the production of OSB. Once this is implemented, external accreditation will then be sought to ensure that the management system meets the requirements of ISO 14001.

Category 1

D.1.2 Good Housekeeping

BAT 2. In order to minimise the environmental impact of the production process, BAT is to apply good housekeeping principles using all of the techniques given below:

(a) Careful selection and control of chemicals and additives;
(b) Application of a programme for the quality control of recovered wood used as raw material and/or as fuel(1), in particular to control pollutants such as As, Pb, Cd, Cr, Cu, Hg, Zn, chlorine, fluorine and PAH;
(c) Careful handling and storage of raw materials and waste;
(d) Regular maintenance and cleaning of equipment, transport routes and raw material storage areas;
(e) Review options for the reuse of process water and the use of secondary water sources.

The current permit application for OSB production includes provision for the use of three different types of resins whilst the preliminary process design is still under review and development. These resins include MUF (melamine-urea-formaldehyde; as is currently in-use onsite for MDF and Particleboard manufacture), PMDI (polymeric diphenylmethane diisocyanate), and PF (phenol formaldehyde). All three resins are recognised in the BREF as types used in OSB manufacturing and it is also possible that the site will use a combination of them, e.g. PMDI could be used for the surface layer and MUF for the core layer. Due to the array of differing benefits and disadvantages of using each type, the selection process is currently on-going. Please see the below table that summarises most, but not all, of the relevant factors that are being considered.

	PMDI	MUF	PF
Advantages	No added formaldehyde: - Reduced CHCO emissions during processing - Reduced CHCO emissions from final product	Familiarity; the site is already accustomed to using these resins	Available within the UK.
	Faster processing time	Raw materials readily available	Raw materials readily available.
	Higher moisture resistance in final product	Consistently available supply, also potential to produce on-site	High moisture resistances, necessary for OSB production.
Disadvantages	'Stickier' resin: - More release agent required which may give rise to higher TOC emissions - Can be more difficult in production	Less effective for use in producing OSB and therefore more expensive.	Higher press temperature required; greater energy consumption
	Limited supply in the UK		Longer processing time; lower production rate
	Due to the nature of this resin and the chemicals used revised control measures will be required to ensure a safe working environment		Darker coloured finished product

All potential resins that Kronospan are considering are considered as BAT for OSB production.

In addition to resin, wax, hardener, and release agent will also be required to manufacture OSB; these are comparable to those currently used in MDF and Particleboard manufacture.

The previous response to BAT 2 (b) through (e) remains valid.

Category 1

BAT 3. In order to reduce emissions to air, BAT is to operate the waste gas treatment systems with a high availability and at optimal capacity during normal operating conditions. Special procedures can be defined for other than normal operating conditions, in particular:

(f) During start-up and shut-down operations;

(g) During other special circumstances which could affect the proper functioning of the systems (e.g. regular and extraordinary maintenance work and cleaning operations of the combustion plant and/or of the waste gas treatment system).

The proposed abatement systems for the OSB process include a wet electro-static precipitator (WESP) for the emissions from the dryers and cyclones and a wet scrubber for the emissions released at the press; both are similar to the established Particleboard process. The former

Particleboard dryers and WESP will be refurbished for OSB, ensuring they are designed for this process.

The proposed OSB processes will also be subject to specific start-up, shutdown, cleaning, and maintenance procedures and the previous response to BAT 3 remains valid.

Category 1

D.2 Noise

BAT 4. In order to prevent or, where that is not practicable, to reduce noise and vibrations, BAT is to use one or a combination of the techniques given below (prevention / point source reduction / site level reduction):

(h) Strategic planning of the plant layout in order to accommodate the noisiest operations, e.g. so that on-site buildings act as insulation (generally applicable in new plants – layout of a site may limit applicability on existing plants);

(i) Applying a noise reduction programme which includes noise source mapping, determination of off-site receptors, modelling of noise propagation and evaluation of the most cost-effective measures and their implementation;

(j) Performing regular noise surveys with monitoring of noise levels outside the site boundaries;

(k) Enclosing noisy equipment in housing or by encapsulation and by soundproofing buildings;

(l) Decoupling individual equipment to pre-empt and limit propagation of vibrations and resonance noise;

(m) Point source insulation using silencer, damping, attenuators on noise sources, e.g. fans, acoustic vents, mufflers, and acoustic enclosures of filters;

(n) Keeping gates and doors closed at all times when not in use. Minimising the fall height when unloading roundwood;

(o) Reducing noise from traffic by limiting the speed of internal traffic and for trucks entering the site;

(p) Limiting outdoor activities during the night;

(q) Regular maintenance of all equipment;

(r) Using noise protection walls, natural barriers or embankments to screen noise sources.

The proposed OSB processes have been subject to noise impact assessment.

Category 1

D.3 Emissions to Soil and Groundwater

BAT 5. In order to prevent emissions to soil and groundwater, BAT is to use the techniques given below:

(s) Load and unload resins and other auxiliary materials only in designated areas that are protected against leakage run-off;

(t) Whilst awaiting disposal, collect all material and store in designated areas protected against leakage run-off;

(u) Equip all pump sumps or other intermediary storage facilities from which spillages may occur with alarms activated by high levels of liquid;

(v) Establish and implement a programme for the testing and inspection of tanks and pipelines carrying resins, additives and resin mixes;

(w) Carry out inspections for leaks on all flanges and valves on pipes used to transport materials other than water and wood; maintain a log of these inspections;

(x) Provide a containment system to collect any leaks from flanges and valves on pipes used to transport materials other than water and wood, except when the construction of flanges or valves is technically tight;

(y) Provide an adequate supply of containment booms and suitable absorbent material;
(z) Avoid underground piping for transporting substances other than water and wood;
(aa) Collect and safely dispose of all water from fire-fighting;
(bb) Construct impermeable bottoms in retention basins for surface run-off water from outdoor wood storage areas.

All chemicals / additives will be stored in purpose-built silos constructed of the most appropriate materials for each item. Wherever required, secondary / tertiary containment will be provided in line with good practice.

Category 1

D.4 Energy Management and Energy Efficiency

BAT 6. In order to reduce energy consumption, BAT is to adopt an energy management plan, which includes all of the techniques given below:

(a) Use a system to track energy usage and costs;
(b) Carry out energy efficiency audits of major operations;
(c) Use a systematic approach to continuously upgrade equipment in order to increase energy efficiency;
(d) Upgrade controls of energy usage;
(e) Apply in-house energy management training for operators.

The previous response remains valid; OSB production will be incorporated into the site's energy management system and will comprise of new and where appropriate, refurbished energy efficient equipment.

Category 1

BAT 7. In order to increase the energy efficiency, BAT is to optimise the operation of the combustion plant by monitoring and controlling key combustion parameters (e.g. O2, CO, NOX) and applying one or a combination of the techniques given below:

(a) Dewater wood sludge before it is used as a fuel
(b) Recover heat from hot waste gases in wet abatement systems using a heat exchanger
(c) Recirculate hot waste gases from different processes to the combustion plant or to preheat hot gases for the dryer

The previous response remains valid; points A and C are used.

Category 1

BAT 8. In order to use energy efficiently in the preparation of wet fibres for fibreboard production, BAT is to use one or a combination of the techniques given below:

(f) Cleaning and softening of chips (Mechanical cleaning and washing of raw chips);
(g) Vacuum evaporation (Recovering hot water for steam generation);
(h) Heat recovery from steam during refining (Heat exchangers to produce hot water for steam generation and chip washing).

Not applicable to OSB production; the previous response remains valid.

Category 1

D.5 Odour

BAT. 9 In order to prevent or, where that is not practicable, to reduce odour from the installation, BAT is to set up, implement and regularly review an odour management plan, as

part of the environmental management system (see BAT 1), that includes all of the following elements:

I. A protocol containing actions and timelines;

II. A protocol for conducting odour monitoring;

III. A protocol for response to identified odour events;

IV. An odour prevention and reduction programme designed to identify the source(s); to measure/estimate odour exposure; to characterise the contributions of the sources; and to implement prevention and/or reduction measures.

The previous response remains valid; the site's DNOMP will be expanded to incorporate OSB production.

Category 1

BAT 10. In order to prevent and reduce odour, BAT is to treat waste gas from the dryer and the press, according to BAT 17 and 19.

See BAT 17 and 19.

Category 1

D.6 Management of Waste and Residues

BAT 11. In order to prevent or, where that is not practicable, to reduce the quantity of waste being sent for disposal, BAT is to adopt and implement a waste management plan as part of the environmental management system (see BAT 1) that, in order of priority, ensures that waste is prevented, prepared for reuse, recycled or otherwise recovered.

The previous response remains valid; OSB processes will be incorporated into the waste management plan for the site. The process is designed to ensure that minimal waste is produced.

All waste streams except any resin-based waste from cleaning / maintenance activities will be similar to those currently generated. However, as Kronospan do not manufacture PMDI or PF resins on-site, and will not be using them as impregnation resins, the volume of any resin waste from these will be significantly less than currently generated (as most resin cleaning waste is generated from the Paper Impregnation department).

Category 1

BAT 12. In order to reduce the quantity of solid waste being sent for disposal, BAT is to use one or a combination of the techniques given below:

(a) Reuse internally collected wood residues, such as trimmings and rejected panels, as a raw material;

(b) Use internally collected wood residues, such as wood fines and dust collected in a dust abatement system and wood sludge from waste water filtration, as fuel (in appropriately equipped on-site combustion plants) or as a raw material;

(c) Use ring collection systems with one central filtration unit to optimise the collection of residues, e.g. bag filter, cyclofilter, or high efficiency cyclones.

Internally collected residues from OSB production will be crushed on-site and fed back into the Particleboard process. The fraction of fines material that is produced from the OSB process that cannot be utilised within OSB production will be sent for use in either Particleboard or MDF. Dusts collected from dust filtration units throughout the process will be burnt on one of the site's biomass boilers, dependent on whether recycled fibre is utilised as a raw material for the core layer of OSB (K8 will solely be used if RCF is incorporated into OSB).

Category 1

BAT 13. In order to ensure the safe management and reuse of bottom ash and slag from biomass-firing, BAT is to use all of the techniques given below:

(a) Continuously review options for off-site and on-site reuse of bottom ash and slag;

(b) An efficient combustion process which lowers the residual carbon content;

(c) Safe handling and transport of bottom ash and slag in closed conveyers and containers, or by humidification;

(d) Safe storage of bottom ash and slag in a designated impermeable area with leachate collection.

The previous response remains valid.

Category 1

D.7 Monitoring

BAT 14. BAT is to monitor emissions to air and water and to monitor process flue-gases in accordance with EN standards with at least the frequency given below. If EN standards are not available, BAT is to use ISO, national, or other international standards that ensure the provision of data of an equivalent scientific quality.

Only those tables which are directly associated with OSB have been included during this review. The previous response remains valid.

TABLE-1 Monitoring of emissions to air from the dryer and for combined treated emissions from the dryer and the press.

1c – OSB WESP

Parameter	Testing Standard	Minimum Monitoring Frequency	Monitoring Associated With	Compliance Category
Dust	EN 13284-1	Periodic measurement at least once every six months	BAT 17	1
TVOC	EN 12619			1
Formaldehyde	No EN standard available*			1
NOX	EN 14792		BAT 18	1
HCl	EN 1911		N/A	1
HF	ISO 15713			1
SO2	EN 14791	Periodic measurement at least once a year		1
Metals	EN 13211 or EN 14385			1
PCDD/F	EN 1948 parts 1, 2 and 3			1
NH3	No EN standard available			1
*in the absence of an EN standard the preferred approach is isokinetic sampling in an impinging solution with a heated probe and filter box and without probe washing, e.g. based on the modified US EPA M316 method				

TABLE-2 Monitoring of emissions to air from the press.

Parameter	Testing Standard	Minimum Monitoring Frequency	Monitoring Associated With	Compliance Category

Dust	EN 13284-1	Periodic measurement at least once every six months	BAT 19	1
TVOC	EN 12619			1
Formaldehyde	No EN standard available*			1
*in the absence of an EN standard the proffered approach is isokinetic sampling in an impinging solution with a heated probe and filter box and without probe washing, e.g. based on the modified US EPA M316 method				

TABLE-4 Monitoring of channelled emissions to air from upstream and downstream processing.

Parameter	Testing Standard	Minimum Monitoring Frequency	Monitoring Associated With	Compliance Category
Dust	EN 13284-1*	Periodic measurement at least once a year	BAT 20	1 – via surrogate parameter
*sampling from bag filters and cyclofilter can be replaced by continuous monitoring of the pressure drop across the filter as an indicative surrogate parameter				

BAT 15. In order to ensure the stability and efficiency of techniques used to prevent and reduce emissions, BAT is to monitor appropriate surrogate parameters. The surrogate parameters monitored may include: waste gas airflow; waste gas temperature; visual appearance of emissions; water flow and water temperature for scrubbers; voltage drop for electrostatic precipitators; fan speed and pressure drop across bag filters. The selection of surrogate parameters depends on the techniques implemented for the prevention and reduction of emissions.
The previous response remains valid; appropriate surrogate parameters will be monitored throughout the OSB processes that are equivalent to those currently used throughout the Particleboard and MDF processes. The specifics of these parameters are yet to be determined however they will be decided upon and agreed through the site's management of change procedure prior to commencement of the process and in consultation with equipment manufacturers.

Category 1

BAT 16. BAT is to monitor key process parameters relevant for emissions to water from the production process, including waste water flow, pH and temperature.
Not applicable to OSB production; previous response remains valid.

D.8 Emissions to Air

D.8.1 Channelled Emissions

BAT 17. In order to prevent or reduce emissions to air from the dryer, BAT is to achieve and manage a balanced operation of the drying process and to use one or a combination of the techniques given below:

(a) Dust abatement of inlet hot gas to a directly heated dryer in combination with one or a combination of the other techniques listed below (dust);

(b) Bag filter (dust);
(c) Cyclone (dust);
(d) UTWS dryer and combustion with heat exchanger and thermal treatment of discharged dryer waste gas (dust, VOCs);
(e) Wet electrostatic precipitator (dust, VOCs);
(f) Wet scrubber (dust, VOCs);
(g) Bioscrubber (dust, VOCs);
(h) Chemical degradation or capture of formaldehyde with chemicals in combination with a wet scrubbing system (formaldehyde).

The emissions from the OSB dryers will be abated via a wet electrostatic precipitator.

Category 1

TABLE-1 BAT-associated emission levels (BAT-AELs) for emissions to air from the dryer and for combined treated emissions from the dryer and the press. The associated monitoring is in BAT 14.

Parameter	Product	Dryer Type	Unit	BAT-AEL	O2 Ref. Condition	Compliance Category
Dust	OSB	Directly heated dryer	mg/Nm³	3 - 30	18%	1
TVOC	OSB	All types		10 - 400	18%	1
Formaldehyde	OSB	All types		< 5 - 20	18%	1

Our answer in respect of Formaldehyde is based on compliance with BREF using the current UK standard nominated and developed by Dr Acton, as an appropriate EN standard is not available.

BAT 18. In order to prevent or reduce NOX emissions to air from directly heated dryers, BAT is to use technique (a) or technique (a) in combination with technique (b):

(d) Efficient operation of the combustion process using air- and fuel-staged combustion, while applying pulverised combustion, fluidised bed boilers or moving grate firing;
(e) Selective non-catalytic reduction (SNCR) by injection and reaction with urea or liquid ammonia.

TABLE-2 BAT-associated emission levels (BAT-AELs) for emissions for NOX emissions to air from a directly heated dryer. The associated monitoring is in BAT 14.

Parameter	Product	Unit	BAT-AEL (average over sampling period)	O2 Ref. Condition	Compliance Category
NOX	OSB	mg/Nm³	30 - 250	18%	1

The previous response is still valid; technique A will be used for the OSB directly heated dryers.

Category 1

BAT 19. In order to prevent or reduce emissions to air from the press, BAT is to use in-duct quenching of collected press waste gas and an appropriate combination of the techniques given below:

(a) Select resins with a low formaldehyde content (VOCs);
(b) Controlled operation of the press with balanced press temperature, applied pressure and press speed (VOCs);

(c) Wet scrubbing of collected press waste gases using Venturi scrubbers or hydrocyclones, etc. (dust, VOCs);
(d) Wet electrostatic precipitator (dust, VOCs);
(e) Bioscrubber (dust, VOCs);
(f) Post-combustion as the last treatment step after application of a wet scrubber (dust, VOCs).

The OSB process will utilise techniques A, B, and C. If MUF or PF resins are used, the formaldehyde content will be as low as possible without compromising product quality, as is currently the case for MUF / UF resins used in the Particleboard and MDF processes. If PMDI resin is selected, there will only be formaldehyde emissions from the wood itself, however due to the increase in release agent that is required when using this resin there may be increased VOC emissions. There will be a new Venturi wet scrubber to abate the dust and VOC emissions from the press prior to release to atmosphere via the WESP stack.

Category 1

TABLE-3 BAT-associated emission levels (BAT-AELs) for emissions to air from the press. The associated monitoring is in BAT 14.

Parameter	Unit	BAT-AEL (average over sampling period)	O2 Ref. Condition	Compliance category
Dust	mg/Nm³	3 - 15	no correction	1
TVOC		10 - 100	no correction	1
Formaldehyde		2 - 15	no correction	1

Our answer in respect of Formaldehyde is based on compliance with BREF using the current UK standard nominated and developed by Dr Acton, as an appropriate EN standard is not available.

BAT 20. In order to reduce dust emissions to air from upstream and downstream wood processing, conveying of wood materials and mat forming, BAT is to use either a bag filter or a cyclofilter. Due to safety concerns, a bag filter or a cyclofilter may not be applicable when recovered wood is used as a raw material. In that case a wet abatement technique (e.g. scrubber) may be used.

TABLE-4 BAT-associated emission levels (BAT-AELs) for channelled dust emissions to air from upstream and downstream wood processing, conveying of wood materials, and mat forming. The associated monitoring is in BAT 14.

Parameter	Unit	BAT-AEL (average over sampling period)	Compliance category
Dust	mg/Nm³	3 - 15	N/A

N/A – Continuous monitoring of the pressure drop across the filter acts as a surrogate parameter and replaces the need to measure.

Dust emissions from wood processing for the proposed OSB processes will be reduced by a combination of, bag filtration systems, cyclones, and wet scrubbers.

Category 1

BAT 21. In order to reduce emissions of volatile organic compounds to air from the drying ovens for the impregnation of paper, BAT is to use one or a combination of the techniques given below:

(a) Select and use resins with a low formaldehyde content;
(b) Controlled operation of ovens with balanced temperature and speed;
(c) Thermal oxidation of waste gas in a regenerative thermal oxidiser or a catalytic thermal oxidiser;
(d) Post-combustion or incineration of waste gas in a combustion plant;
(e) Wet scrubbing of waste gas followed by treatment in a biofilter.

Not applicable to OSB production; previous response remains valid.

Category 1

D.8.2 Diffuse Emissions

BAT 22. In order to prevent or, where that is not practicable, to reduce diffuse emissions to air from the press, BAT is to optimise the efficiency of the off-gas collection and to channel the off-gases for treatment (see BAT 19). Effective collection and treatment of waste gases (see BAT 19) both at the press exit and along the press line for continuous presses. For existing multi-opening presses the applicability of enclosing the press may be restricted due to safety reasons.

All off-gases will be channelled to a new wet scrubber prior to release via the WESP (as is the case for Particleboard and MDF emissions currently).

Category 1

BAT 23. In order to reduce diffuse dust emissions to air from the transport, handling, and storage of wood materials, BAT is to set up and implement a dust management plan, as part of the environmental management system (see BAT 1) and to apply one or a combination of the techniques given below.

(a) Regularly clean transport routes, storage areas and vehicles;
(b) Unload sawdust using covered drive-through unloading areas;
(c) Store sawdust dust-prone material in silos, containers, roofed piles, etc. or enclose bulk storage areas;
(d) Suppress dust emissions by water sprinkling.

The previous response remains valid. The arrangements in place on the site will be extended to encompass OSB production.

Category 1

D.9 Emissions to Water

BAT 24. In order to reduce the pollution load of the collected waste water, BAT is to use both of the techniques given below:

(a) Collect, and treat separately, surface run-off water and process waste water;
(b) Store any wood except roundwood and slabs on a hard-surfaced area.

The previous response remains valid. The arrangements in place on the site will be extended to encompass OSB production.

Category 1

BAT 25. In order to reduce emissions to water from surface run-off water, BAT is to use a combination of the techniques given below:

(a) Mechanical separation of coarse materials by screens and sieves as preliminary treatment;
(b) Oil-water separation;
(c) Removal of solids by sedimentation in retention basins or settlement tanks.

The previous response remains valid. The arrangements in place on the site will be extended to encompass OSB production.

Category 1

BAT 26. In order to prevent or reduce the generation of process waste water from wood fibre production, BAT is to maximise process water recycling. Recycle process water from chip washing, cooking and/or refining in closed or open loops by treating it at the refiner plant level by mechanical removal of solids, in the most appropriate manner, or by evaporation.

Not applicable to OSB production; previous response remains valid.

Category 1

BAT 27. In order to reduce emissions to water from wood fibre production, BAT is to use a combination of the techniques given below:

(a) Mechanical separation of coarse materials by screens and sieves;
(b) Physico-chemical separation, e.g. using sand filters, dissolved air flotation, coagulation and flocculation;
(c) Biological treatment.

Not applicable to OSB production; previous response remains valid.

Category 1

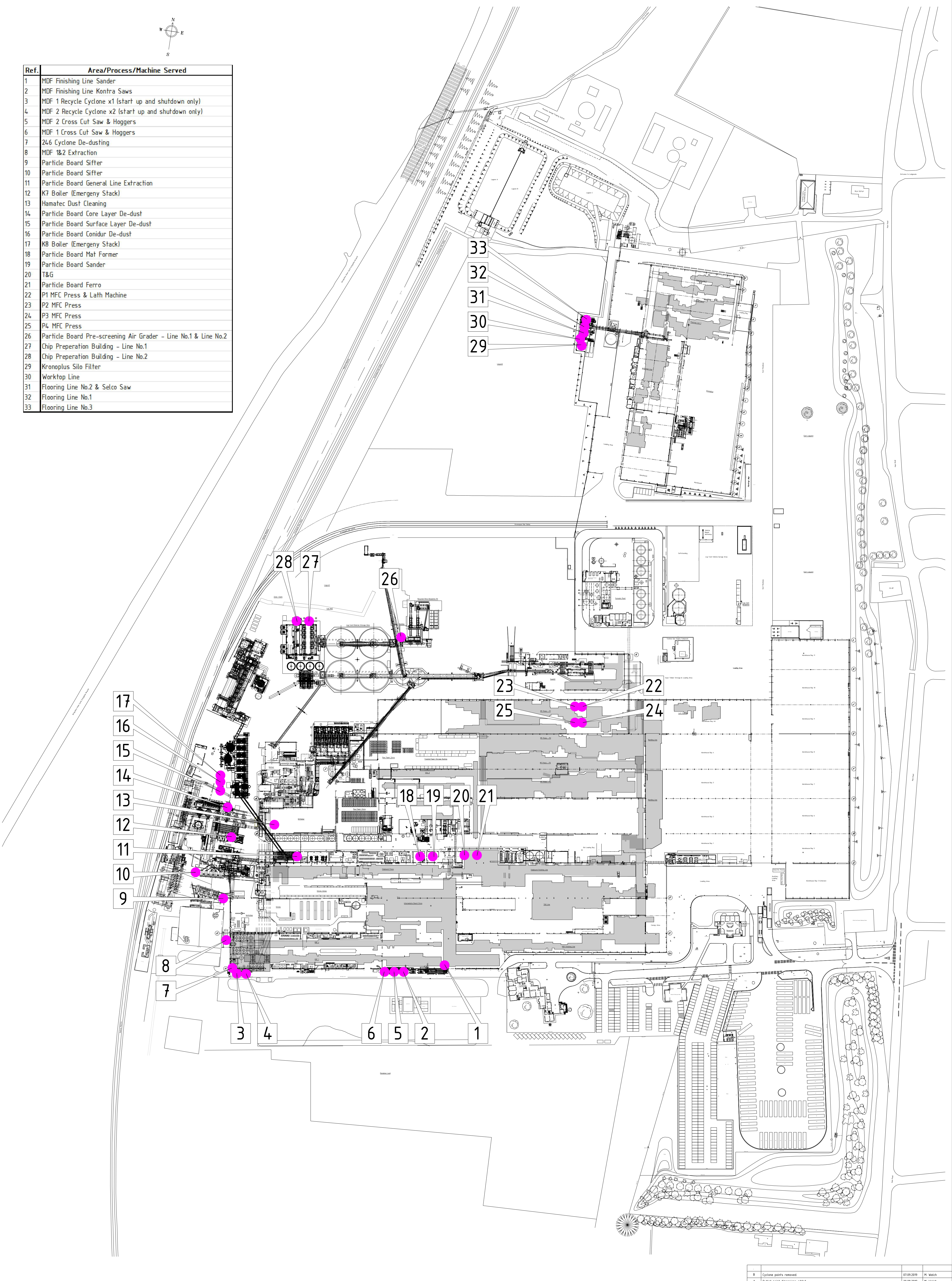
BAT 28. In order to prevent or reduce the generation of waste water from wet air abatement systems that will need treatment prior to discharge, BAT is to use one or a combination of the techniques given below:

(a) Sedimentation, decanting, screw and belt presses to remove collected solids in wet abatement systems;
(b) Dissolved air flotation. Coagulation and flocculation followed by removal of floccules by flotation aided by dissolved air.

The OSB WESP will utilise technique A.

Category 1

E Emission Point and Particle Filtration Points Drawings



Ref.	Area/Process/Machine Served
1	MDF Finishing Line Sander
2	MDF Finishing Line Kontra Saws
3	MDF 1 Recycle Cyclone x1 (start up and shutdown only)
4	MDF 2 Recycle Cyclone x2 (start up and shutdown only)
5	MDF 2 Cross Cut Saw & Hoggers
6	MDF 1 Cross Cut Saw & Hoggers
7	246 Cyclone De-dusting
8	MDF 1&2 Extraction
9	Particle Board Sifter
10	Particle Board Sifter
11	Particle Board General Line Extraction
12	K7 Boiler (Emergeny Stack)
13	Hamatec Dust Cleaning
14	Particle Board Core Layer De-dust
15	Particle Board Surface Layer De-dust
16	Particle Board Conidur De-dust
17	K8 Boiler (Emergeny Stack)
18	Particle Board Mat Former
19	Particle Board Sander
20	T&G
21	Particle Board Ferro
22	P1 MFC Press & Lath Machine
23	P2 MFC Press
24	P3 MFC Press
25	P4 MFC Press
26	Particle Board Pre-screening Air Grader - Line No.1 & Line No.2
27	Chip Preperation Building - Line No.1
28	Chip Preperation Building - Line No.2
29	Kronoplus Silo Filter
30	Worktop Line
31	Flooring Line No.2 & Selco Saw
32	Flooring Line No.1
33	Flooring Line No.3

Revision	Description	Date	Name
B	Cyclone points removed.	07.09.2019	M. Welch
A	Outlet point dimensions added.	20.08.2019	M. Welch

Status

	Date	Name
Project leader		
Drawn	30.07.2019	M.WELCH
Checked		

Size: A0

Scale: 1:1000

origin

Norm: ISO

Xylo Technologies AG
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Technology

Kronospan Ltd
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United Kingdom

Project number

Projekt name

Description

Site Plan
Particulate Filtration Points

Drawing number: 7000/604

Index: B

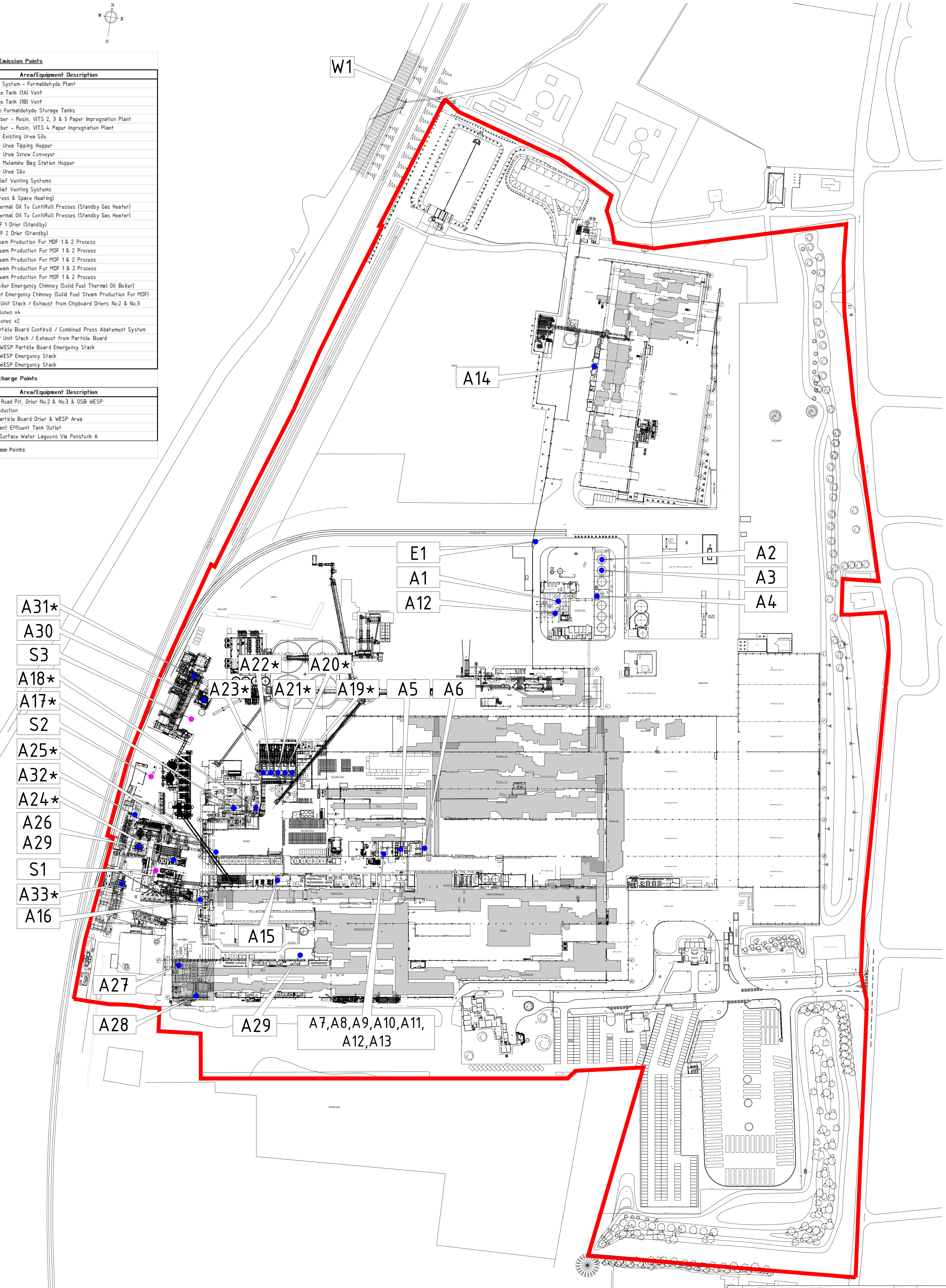
Sheet/Number: /

Natural Resources Wales Emission Points

Ref.	Area/Equipment Description
A1	Emission Control System - Formaldehyde Plant
A2	Methanol Storage Tank (1A) Vent
A3	Methanol Storage Tank (1B) Vent
A4	Wet Scrubber on Formaldehyde Storage Tanks
A5	Nairb Wet Scrubber - Resin, VITS 2, 3 & 5 Paper Impregnation Plant
A6	Nairb Wet Scrubber - Resin, VITS 4 Paper Impregnation Plant
A7	Exhaust Fan For Existing Urea Silo
A8	Exhaust Fan For Urea Tipping Hopper
A9	Exhaust Fan For Urea Screw Conveyor
A10	Exhaust Fan For Melamine Bag Station Hopper
A11	Exhaust Fan For Urea Silo
A12	All Pressure Relief Venting Systems
A13	All Pressure Relief Venting Systems
A14	K1 Kronoplus (Press & Space Heating)
A15	K5 Rawboard Thermal Oil To ContiRoll Presses (Standby Gas Heater)
A16	K6 Rawboard Thermal Oil To ContiRoll Presses (Standby Gas Heater)
A17*	GT1 Heat To MDF 1 Drier (Standby)
A18*	GT2 Heat To MDF 2 Drier (Standby)
A19*	Gas Engine 1 Steam Production For MDF 1 & 2 Process
A20*	Gas Engine 2 Steam Production For MDF 1 & 2 Process
A21*	Gas Engine 3 Steam Production For MDF 1 & 2 Process
A22*	Gas Engine 4 Steam Production For MDF 1 & 2 Process
A23*	Gas Engine 5 Steam Production For MDF 1 & 2 Process
A24*	K7 Solid Fuel Boiler Emergency Chimney (Solid Fuel Thermal Oil Boiler)
A25*	K8 Biomass Plant Emergency Chimney (Solid Fuel Steam Production For MDF)
A26	New OSB WESP Unit Stack / Exhaust from Chipboard Driers No.2 & No.3
A27	MDF 2 Drier Cyclones x4
A28	MDF 1 Drier Cyclones x2
A29	MDF 1 & 2 & Particle Board Contiroll / Combined Press Abatement System
A30	Drier No.4 WESP Unit Stack / Exhaust from Particle Board
A31*	Drier No.4 OSB WESP Particle Board Emergency Stack
A32*	Drier No.3 OSB WESP Emergency Stack
A33*	Drier No.2 OSB WESP Emergency Stack

Surface & Foul Water Discharge Points

Ref.	Area/Equipment Description
S1	Zone 1 - Middle Road Pit, Drier No.2 & No.3 & OSB WESP
S2	Zone 2 - Preproduction
S3	Zone 3 - New Particle Board Drier & WESP Area
E1	Formaldehyde plant Effluent Tank Outlet
W1	Discharge From Surface Water Lagoons Via Penstock A
*	Emergency Release Points



Key:-

- Installation Boundary
- NRW Air Emission Points
- Welsh Water Surface Water Discharge

NOTES

- This drawing is for general information only. Do not scale.
- T1 & T2 oak trees with tree preservation orders.

Revision	Description	Date	Name
O	Wrexham C.B.C monitored points reassigned & N.R.W. referencing updated.	06.08.19	M.W.
N	N.R.W. Referencing updated.	19.05.17	M.W.
M	General update.	14.03.17	M.W.
L	Combustion areas & NRW added.	30.11.16	C.N.
K	Emission points to air A1-A6, E1 & W1 added.	11.11.15	M.W.
J	No.4 & No.6 removed. Text amended for Ceatec abatement system.	10.09.14	M.T.
I	Emission points numbering re-arranged. Amendment to Biomass & Nairb stacks.	02.10.13	B.H.
H	Emission points numbering re-arranged.	07.09.12	P.H.
G	Emission points list & key added.	01.08.12	M.T.
F	Addition of further emission points.	31.07.12	M.T.
E	Biomass plant & MDF 1 emission points added.	30.03.12	M.T.
D	Lagoon 3 & catchment areas added.	23.11.10	M.T.
C	Curtilage amended. East mound added.	09.04.09	M.T.
B	Curtilage amended. East mound added.	30.03.06	M.T.
A	General update.	25.06.04	M.T.

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Status		Date	Name	Size	Scale
	Project leader			A0	1:1000
	Drawn	29.01.04	MIKE_TITCOMBE	origin	Norm ISO
	Checked				

Project number: .
Projekt name

Description
Site Plan
Areas Of Environmental Responsibility

Drawing number: 7000/282 | Index: 0 | Sheet/Number: 1/1

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